NAVAL POSTGRADUATE SCHOOL
Monterey, California

THESIS

AN ANALYSIS OF THE IMPACT OF MILITARY EXPORT OFFSETS ON THE UNITED STATES INDUSTRIAL BASE

by

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September 1998

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REPORT DOCUMENTATION PAGE

Form Approved OMB No. 0704-0188

1. AGENCY USE ONLY (Leave Blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	September 1998	Master's Thesis

4. TITLE AND SUBTITLE
An Analysis of the Impact of Military Export Offsets on the United States Industrial Base

5. FUNDING NUMBERS

6. AUTHOR(S)
David G. McCord

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Naval Postgraduate School
Monterey, CA 93943-5000

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES
The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government

12A. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution is unlimited

12b. DISTRIBUTION CODE

13. ABSTRACT *(maximum 200 words)*

The purpose of this thesis is to determine what effect the growth of offsets, as a condition of sale of military articles, has had on the U.S. defense industrial base. These effects are measured by assessing how this trade practice has impacted the employment, trade, and competitiveness of the U.S. defense industry. Additionally, the present U.S. Government policy towards offsets is explained. Analytical data taken from both Office of Management and Budget and Department of Commerce reports are presented and analyzed. Interviews with large and small- to medium-sized business spokesmen, in addition to Department of Commerce experts, are presented to augment the quantitave results. Different levels of U.S. Government oversight are explained as well as their advantages and disadvantages. The macroeconomic effects of offsets on the U.S. defense industry are inconclusive. However, offsets do seem to impact the U.S. defense industry adversely at the subcontractor level when specific industrial sectors are analyzed. Large defense contractors view offsets as a necessary marketing tool in order to maintain global competition. Most small- to medium-sized contractors do not support the use of offsets, claiming that they export jobs and work orders overseas, eroding the defense industrial base at the subcontractor level.

14. SUBJECT TERMS	15. NUMBER OF PAGES
defense contractors, offsets, defense industrial base, defense industry	127
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	UL

NSN 7540-01-280-5500

Standard Form 298 (Rev 2-89)
Prescribed by ANSI Std Z39-18
298-102

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Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL
September 1998

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I. INTRODUCTION

A. BACKGROUND

The Greek chronicler, Hemocrates, noted 2400 years ago that the ability to wage war – as well as to influence events in the world without using military power – depends to a large degree upon a nation's wealth. A strong productive base provides the means and leverage for action and enhances a nation's ability to influence the outcome of international events. The Cold War, in large part, turned out to be a contest between the superpowers' productive and technological bases. While the United States experienced steady growth, the declining Soviet productive base could not support both the demands of the military establishment and those of the Soviet people. Probably more than any other single factor, this poor economic performance let to the demise of the Soviet Union as a superpower and its subsequent dissolution as a state. (Abbott, 1996)

Since the end of the Cold War, the United States Department of Defense (DoD) weapons procurement budget has declined significantly from a peak of $97 billion in 1985 to $44 billion in 1998 (Wayne, 1998). Accompanying this drastic reduction in weapons procurement, American weapons manufacturers have had to rely more heavily on overseas business to market their wares. Although the U.S. has a strategic aim to arm its friends and allies with U.S. compatible equipment, the reduction in both defense sales and defense industry output has raised concerns. As Under Secretary of Defense for Acquisition and Technology Paul G. Kaminski said in 1996,

> Over the past 30 years, the changes in the industrial base that supports the U.S. defense establishment have been as dramatic as the changes in the world order since the demise of the Soviet Union. U.S. and Western European defense purchases have declined while commercial markets have expanded. The rapid growth of the commercial industrial sector is driven by a commercial market flourishing quite independently of the defense sector. (Kaminski, 1996)

U.S. industries needing to stimulate overseas business have fostered the growth of a marketing tool known as "offsets." Offsets, whether direct or indirect, are terms of a sale, whereby the purchasing country receives additional consideration beyond the military equipment itself. Realizing the leverage they have on American businesses who need to make a sale, foreign countries are requiring that these American businesses help "offset" the high costs of these weapons sales. Foreign buyers are extremely interested in not only purchasing the weapon system, but also improving their own industrial and economic position. Countries require offsets for a variety of reasons: to ease the burden of large defense purchases on their economy; to increase or preserve domestic employment; to obtain desired technology; and to promote targeted industrial sectors. Purchasing countries may require U.S. contractors to manufacture part of the weapon system in their country, invest directly in the country, transfer technology, or agree to purchase and market some of the country's own exports. For example, in selling an aerospace platform to Spain, the U.S. prime contractor is locally sourcing aircraft parts and related software (direct offsets), as well as taking back wine, chemicals, stone products, canned fruit and vegetables, and motor vehicle parts as compensation (indirect

offsets). Oftentimes, a country will not even consider a weapons purchase unless there is an offset provision written into the contract. (DISAM, 1989)

This situation begs the question, What are the effects of these offset transactions on the U.S.' own economy? While the use of offsets may help generate overseas business, could their protracted use have negative effects on U.S. employment, the U.S. position as the world's technology leader, and the long-term trade position of the United States? If long-term negative effects are anticipated, what role, if any, should the Federal Government play in regulating these offsets?

B. PURPOSE

The purpose of this thesis is to determine what effect the growth of military offsets, as a condition of sale of military articles, has had on the U.S. industrial base. The objectives are to determine why offsets have become so commonplace in military export transactions and assess their advantages and disadvantages to the U.S. defense industry and the U.S. economy as a whole. The effect of these offset agreements will be measured by assessing the impact this trade practice has had on the employment, trade, and competitiveness of the U.S. defense industrial base. Additionally, the position of the U.S. Government towards offsets will be explained and the different levels of Government involvement in regulating offsets will be analyzed.

C. RESEARCH QUESTIONS

1. Primary

What are the long term advantages and disadvantages of utilizing offsets for the United States' industrial base?

2. Subsidiary

- What role do military offsets play in the United States' Security Assistance Program?
- What trends exist in the growth rate of offsets with respect to U.S. military sales in recent years?
- How have offsets impacted U.S. employment?
- How have offsets impacted U.S. industrial competitiveness?
- How have offsets impacted U.S. trade?
- What is the current U.S. Government's position on offsets?

D. SCOPE

This thesis analyzes the growth of direct and indirect offsets and U.S. defense industry's reaction to this growth. Although some may believe that the use of offsets may have adverse effects on the U.S. economy, the fact that U.S. businesses voluntarily enter into these agreements implies that the use of offsets has positive effects for these businesses. This thesis' goal is to determine the macro-economic effect of these transactions on the U.S. economy. Both empirical data and the opinions of industry representatives will be used to determine these effects. Empirical data is limited to years 1980 through 1987 and 1993 through 1995. No data was collected during years 1988

through 1992 for two reasons: 1) the Office of Management and Budget (OMB) determined that the results of their 1990 offsets study precluded the necessity of further data collection; and 2) offset data collection and reporting responsibilities switched from OMB to the Department of Commerce (DoC) during this period (DoC, 1998). Findings will be further categorized into those involving major defense contractors and smaller subcontractors. This thesis will examine overall trends and will not focus on specific industries or weapons purchasers. While in recent years other industrial and economic factors have effected the defense industrial base (for example, mergers of defense contractors), this thesis focuses on how ofsets have contributed to any defense industry trends.

E. METHODOLOGY

The methodology for research for this thesis includes literature reviews, interviews with defense industry and Government representatives, and a review of U.S. Government documents related to offsets published by the Office of Management and Budget, Department of Commerce, and the Bureau of Export Analysis. The reports from these Government agencies will be analyzed to determine the growth in the use of offsets, their impact on the defense industry, and their impact on the U.S. economy as a whole. This analysis will be based upon trends derived from empirical data and feedback obtained from defense industry representatives. A summary of the interviews with industry representatives can be found in Appendix A. Finally, the U.S. Government's

current position on offsets will be explained followed by descriptions and analyses of varying degrees of Government intervention in the offset process.

F. ORGANIZATION

Chapter II describes the background of security assistance as an element of foreign policy and examines its historical use by the United States. The security assistance programs of Foreign Military Sales and Commercial Sales are highlighted. This chapter also illustrates how offsets have evolved to become an essential element in the making of a sale to a foreign buyer. The differences between direct and indirect offsets is also explained. This chapter concludes with an explanation of the U.S. Government's current position on the use of offsets.

Chapter III is an empirical analysis of offset data collected by the Office of Management and Budget (OMB) and the Department of Commerce (DoC). This analysis includes the background of the studies; trends in both direct and indirect offset growth, and trends in employment, trade, and global competition for the U.S. industrial base from 1980-1987 and 1993-1995. Although OMB reports attempt to analyze the impact of offsets on employment, trade, and industrial competition, DoC reports do not contain this analysis. A review of OMB's methodology is given followed by an explanation of the errors in their analysis. Methods of improving both the data collection and methodology of this study conclude the chapter.

Chapter IV is an analysis of industrial reactions to offset growth. Data from both Bureau of Export Analysis surveys and interviews are used for this analysis. The analysis

focuses on how industry representatives see offsets impacting employment, trade, and global competition. This data is further divided into responses from large defense businesses and responses from medium and small defense businesses.

Chapter V analyzes the role of the U.S. Government regarding offsets. The current Government position is explained, as are different levels of Government involvement. The advantages and disadvantages of these different levels of involvement are then analyzed.

Chapter VI draws conclusions from these analyses and provides a summary on the impacts of offsets on the industrial base and industry concerns and attitudes regarding offsets. Additionally, recommendations are made as to how the U.S. Government should oversee the use of offsets. The chapter concludes with areas for further research.

II. BACKGROUND

The ultimate goal of United States foreign policy is to bolster the country's national security. Through diplomacy and, sometimes, a show of force, the United States aims to maintain its national strength, revitalize our bond to allies, reduce the peril of nuclear war, build rational relationships with potential adversaries, help resolve regional conflicts, and enhance global cooperation. This is far from easy. After the end of the Cold War and the demise of the Soviet Union, many potential adversaries who became increasingly difficult to identify and monitor had replaced our traditional solitary foe. The increase in terrorism, the proliferation of nuclear weapons, and horrible ethnic conflicts have both increased the United States' involvement in military operations other than war and made maintaining a consistent and positive foreign policy with both our allies and other nations a constant juggling act.

A major tool of United States foreign policy is that of security assistance. Security assistance serves United States interests by assisting our friends and allies to acquire, maintain, and, if necessary, employ the capability of self-defense. Security assistance programs, ultimately, serve the United States by complementing its own defense posture and revitalizing allies. This chapter briefly describes the background of the United States' security assistance program and then discusses Foreign Military Sales, Commercial Sales, and the rationale and utilization of offsets.

A. SECURITY ASSISTANCE

1. Definition

Security Assistance is the group of programs authorized by the Foreign Assistance Act of 1961, as amended, and the Arms Export Control Act, as amended, or other related statutes by which the United States provides defense articles, military training, and other defense related services, by grant, credit or cash sales, in furtherance of national policies and objectives. Not only is this policy designed to assist our allies, it also furthers U.S. interests by enhancing deterrence, strengthening alliances, promoting regional stability, helping ensure access to vital overseas military facilities, improving U.S. power projection and forward defense capabilities, and reinforcing relationships in order to assure access to vital yet scarce raw materials. (DISAM, 1989)

Security Assistance is an umbrella term made up of seven components:

- Foreign Military Sales (FMS) and Foreign Military Construction
- Commercial Sales Licensed under the Arms Export Control Act of 1968 (AECA)
- The Foreign Military Pricing Program
- The Military Assistance Program
- The International Military Education and Training (IMET) Program
- The Economic Support Fund
- Peacekeeping Operations (PKO)

This thesis will concentrate on the first and second components: Foreign Military Sales and Commercial Sales.

2. Security Assistance History

Security Assistance has been a part of international relations as long as man has engaged in warfare. Whether motivated by economic goals or the realization that one combatant is preferable to another, security assistance aims to establish and reinforce relationships that are beneficial to the country providing the aid.

This nation's first experience with security assistance was actually on the receiving end. During the Revolutionary War, the United States received arms and other military assistance from France, whose aim was to limit British expansion in the Northern Hemisphere. With the British entangled in a protracted war with the United States, France could expand and reinforce its own economic and military position in North America. Following the Revolutionary War, the United States turned its attention to within its own borders – developing its political and economic structures and expanding its borders from coast to coast. Little effort was made to expand U.S. foreign relations much beyond commercial interests. Even after the acquisition of Guam, the Philippines, and Puerto Rico after the Spanish American War of 1898, the nation retained its isolationist stance and resisted foreign entanglements. (DISAM, 1989)

With the onset of World War I, the United States, despite its declared neutrality, rapidly emerged as the leading participant in the international munitions trade. During the period of its neutrality (August 1914 through March 1917) the United States exported approximately $2.2 billion in war supplies to Europe. In fact, by 1920 the United States accounted for more that 52 percent of the global arms exports. The fact that the United States ranked so high among the world's leading arms exporters caused a great

controversy that was reflected in much public debate and discussion throughout the 1920's and 1930's. There was an uneasy concern throughout the country regarding the unwanted but thriving arms industry. (DISAM, 1989)

Between World Wars, America's continued debate over its role as an arms merchant led to the establishment of a special Senate Munitions Investigating Committee in 1934. Headed by Senator Gerald Nye of North Dakota, an avowed isolationist, the Committee's task was to determine if a commercial profit motive was the primary cause and continued sustenance of war. The Committee recommended that the U.S. arms industry be nationalized in order to take away the opportunity for private gain. Although this recommendation was rejected, it did lead to the establishment of a Munitions Control Board which exercised greater Government control and oversight of the U.S. arms industry. (DISAM, 1989)

World War II signaled a fundamental change in U.S. foreign policy as it related to the arms trade. Prior to U.S. entry into World War II, the Neutrality Act was revised in 1939 allowing the sales of arms during peacetime to the British on a cash and carry basis. This policy was eventually broadened to include arms support for other allied nations. One of the most famous examples of arms support under this policy was the Lend-Lease program of 1941. Eventually providing about $50 billion of arms, food, and other aid to our allies, the Lend-Lease program "lent" materials to allies under the premise that it would be paid back or replaced in kind by materials provided to the United States. (DISAM, 1989)

The end of World War II saw the rise of the two post war superpowers, the United States and the USSR. Confronted with the diametrically opposed philosophy of communism, post World War II Presidents formulated doctrines to combat this new threat. President Truman requested Congress to appropriate $400 million to aid Turkey and Greece in combating a communist insurrection in March of 1947. Over the next three years, over $600 million in aid was given to these countries in the form of surplus U.S. arms. These were given free of charge as "grant aid" under the new Military Assistance Program. This policy, known as the Truman Doctrine, worked with other plans like the Marshall Plan to frustrate Soviet attempts to expand their military, economic, and political base. (DISAM, 1989)

Possibly the most significant alliance that affected U.S. security assistance policy was the formation of the North Atlantic Treaty Organization (NATO) in 1949. The NATO alliance provided the foundation for increased and preferential treatment of NATO member countries for security assistance, to include: provisions of arms, exclusions from arms control legislation, and international cooperative armaments projects. This preferential treatment accounted for NATO countries receiving approximately 56 percent of all American arms transferred under the Military Assistance Program and the Foreign Military Sales Program in 1965. (DISAM, 1989)

During the 1950's, however, certain developments changed how assistance was provided. As World War II stockpiles dwindled, U.S. aid came in the form of technical assistance and industrial equipment to expand local European defense production. However, as each country's arms production capability increased, their government

demanded arms of local designs, development, and production to increase the self-sufficiency of its arms production capability and economic development. NATO member countries were no longer satisfied with purchasing arms from the U.S., United Kingdom, and France on the traditional buyer-seller relationship. Instead, they were motivated by both national security and economic factors to develop their own inherent capability.

The expansion of the U.S. containment policy, aimed primarily at curbing Soviet expansion, continued to grow by including the Middle East, Southeast Asia, and Latin America. Broadened by doctrines such as the Eisenhower Doctrine, U.S. foreign policy expanded the containment strategy to apply to the protection not only of nations on the periphery of the Soviet Union, but of the world at large, including many nations regarded by their leaders as nonaligned. President Kennedy's "Alliance for Progress" provided economic assistance to Latin America to create a stable social structure capable of fending off revolutionary threats, with the implied objective of restraining the expansion of Cuban influence in the region. (DISAM, 1989)

It was during the Nixon Administration that we find many of the features of present day U.S. security assistance policy formalized. Termed the Nixon Doctrine, this policy stated that, although the U.S. would continue to bear responsibility for the deterrence of nuclear and general war, the responsibility for localized wars remained the responsibility of those countries threatened by it. U.S. assistance would continue in the form of grant assistance and not necessarily military forces. This doctrine was mainly a product of the public reaction against the major but largely unsuccessful military intervention in Vietnam during the 1960's. However, U.S. transfer of arms to the Middle

East increased dramatically with Iran, Israel, and Saudi Arabia being the principal recipients. The U.S. foreign policy goal in this instance was to maintain a regional balance, primarily in order to maintain the flow of oil from this area. (DISAM, 1989)

The Ford Administration was plagued with political trauma on the domestic front, continuing disagreements with the Soviets, and incipient recession. Complicated relationships with Congress arose, partly due to congressional pressure to restrain arms sales despite a high foreign demand for armaments. The President was faced with the dilemma of meeting requests for U.S. arms as part of our foreign policy while still remaining within the bounds of pending legislation. This new legislation, which reflected demands for greater controls on arms sales, found expression in the International Security Assistance and Arms Export Control Act (AECA) of 1976. This act was amended in 1977, but was seen by both President Ford and President Carter as extremely restrictive and impinging on the Executive Branch's prerogative to implement foreign policy. (DISAM, 1989)

President Carter, however, decried the unrestrained global spread of conventional weaponry citing that global arms sales had risen to over $20 billion annually with the U.S. accounting for over half of that amount. In order to reverse the thrust of conventional arms sales, President Carter announced that arms transfers would be viewed as an "exceptional foreign policy implement" and the burden of persuasion for sales would fall on those who favored a particular arms sale, rather than those who opposed it. (DISAM, 1989)

On 8 July, 1981, President Ronald Reagan announced a new Conventional Arms Transfer Policy that viewed arms transfers as an essential element of our global defense policy and an indispensable component of U.S. foreign policy. The new policy included the following points:

- Reinforce military capabilities to assist in the deterrence of aggression, especially from the USSR and its surrogates, and reduce the requirements for direct U.S. involvement in regional conflict.
- Reinforce the perception of friends and allies that the U.S., as partner, is also a reliable supplier with a measurable and enduring stake in the security of the recipient country.
- Point out to potential enemies that the U.S. will not abandon its allies or friends or allow them to be militarily disadvantaged.
- Improve the American economy by assuring a more stable defense production base, and by enhancing the balance of payments. However, this objective should not be construed that the approval of the transfer of arms will be based solely or even primarily on economic considerations or gain.
- Enhance the effectiveness of the U.S. military through improved possibilities of access to regional bases, ports, or facilities needed for the support of deployed forces during contingencies. Further, security assistance should be such as to improve the ability of the host nations to complement U.S. forces during deployments.
- Strengthen the stability of a region and the internal security of the countries therein by fostering a sense of a recipient nation's security and thereby its willingness to settle disputes amicably. Through this objective, it is held that a government that feels secure is more likely to cope with such challenges in a more progressive and enlightened manner.

A pivotal point of the Reagan policy was that the U.S. could not alone defend western security interests. Thus, the U.S. would give urgent heed to the security requirements of friends and allies – not as an alternative to a U.S. commitment or capability but as a complement to it. The U.S. would assess the transfer of arms in light of the net

contribution such transfers would make to U.S. global or regional security. In the last decade, the Bush and Clinton Administrations' approaches to the use of security assistance as a means to support national interests has remained essentially unchanged. (DISAM, 1989)

3. Current Security Assistance Policies

The U.S. security assistance program has its foundation in the U.S. public laws which provide security assistance authorizations and appropriations. Two basic acts are involved with respect to the current U.S. security assistance program. Both of these acts are amended either annually or biennially.

The first is the Foreign Assistance Act (FAA) of 1961, as amended. The FAA was enacted on September 4, 1961, for five of the seven security assistance programs along with a wide variety of other foreign assistance programs.

The second act is the Arms Export Control Act (AECA), as amended. It actually came into being as the Foreign Military Sales Act of 1968 but was renamed in 1976 as the AECA. This act provides the authority for both Foreign Military Sales and commercial sales. Figure 1 shows the major Security Assistance Authorization Acts that still legislate Security Assistance policies. (DISAM, 1989)

These Acts outline certain conditions in order for a country to be eligible for sales from the United States. A country is eligible if:

Figure 1. Basic Security Assistance Authorization Acts Since 1954. (DISAM, 1989)

- the President finds that the furnishing thereof will strengthen the security of the U.S. and promote world peace.
- the country has agreed not to transfer title to, or possession of, any articles/services, unless the consent of the President has been obtained.
- the country has agreed to provide substantially the same degree of security protection afforded to such article or service by the U.S. Government.
- the country is otherwise eligible to purchase defense articles/services. (DISAM, 1989)

Additionally, there are several restrictions which will deny a country eligibility to receive arms sales from the U.S. No assistance shall be provided to countries that:

- grant sanctuary to international terrorists.
- are dominated or controlled by the international Communist movement.
- are indebted to any U.S. citizen for goods or services.
- nationalize, seize, or expropriate property owned or controlled by U.S. citizens, corporations, etc.
- are in default on any loan to the United States in excess of six months.
- are engaged in a consistent pattern of acts of intimidation or harassment directed against individuals in the U.S.
- deliver or receive nuclear enrichment or reprocessing equipment, material, or technology or transfer a nuclear device to a non-nuclear state.
- sever diplomatic relations with the U.S. or with which the U.S. severs relations.
- that prevents any U.S. person from participating in the provision of defense articles/services on the basis of race, religion, natural origin, or sex.
- that is engages in illicit drug production and has failed to take adequate steps to prevent such drugs from being sold to U.S. Government personnel or their dependents or from being smuggled into the U.S.
- whose duly elected Head of Government is deposed by military coup or decree.

- which is in default to the United States for a period in excess of one calendar year on any foreign assistance/security assistance loan.
- which is engaged in a consistent pattern of opposition to the foreign policy of the U.S.
- the government of which engages in a consistent pattern of gross violations of internationally recognized human rights. (DISAM, 1989)

In 1984, Congress enacted amendments to the Defense Production Act of 1950 which directed the President to submit an annual report to the Congress on the impact of offsets to the defense preparedness, industrial competitiveness, employment, and trade of the United States. This report and its heretofore results will be discussed in Chapter III.

B. FOREIGN MILITARY SALES/COMMERCIAL SALES

1. Foreign Military Sales

a. Definition

Foreign Military Sales (FMS) is defined as a non-appropriated program through which eligible foreign governments purchase defense articles, services, and training from the United States Government. (DISAM, 1989)

b. FMS Process

The FMS process begins when a foreign purchaser makes a request, via a Letter of Request (LOR), to the military department having cognizance over the defense article or service through normal U.S. diplomatic channels. Once the military department has received the LOR, the request is validated to ensure that the potential customer is an eligible FMS recipient, that the article or service requested may be sold, and that the request has been received through normal channels. The Defense Security Assistance

Agency (DSAA) maintains a military article and services list (MASL) which identifies the military articles and services eligible for FMS. If the item requested is not on the MASL, a policy level decision must be made whether or not to make the sale. (DISAM, 1989)

Once the LOR has cleared the initial screening, the military department will draft a Letter of Offer and Acceptance (LOA) which will be reviewed by the DSAA and Department of State. Specific dollar thresholds determine whether pre-sale congressional approval is required. If the sale involves major defense equipment less than $14 million, other defense articles/services less than $50 million, or design and construction services less than $200 million, pre-sale congressional notification is not required and, once DSAA and Department of State approval is received, the FMS offer is made to the foreign country. However, if the sale involves thresholds greater than those stated above, the President will submit a numbered certification to the Congress that includes the justification and impact of the sale once DSAA and the Department of State have reviewed the request. Congress then has 30 calendar days to adopt a joint resolution objecting to the sale. If a joint resolution is not adopted, then a Letter of Offer and Acceptance (LOA) stating the conditions of the sale is issued to the requesting government for its review and acceptance/rejection. In order to assist the Congress and provide them with sufficient time to review each case, the Defense Security Assistance Agency (DSAA) will provide the Congress with 20 days advance notification of each case prior to the formal submission of statutory notification.

2. Commercial Sales

a. Definition

Commercial Sales (also referred to as Direct Commercial Sales and Commercial Sales Licensed under the AECA) is a sale made by U.S. industry directly to a foreign buyer. The Commercial Sales agreement is not administered by the Department of Defense and does not involve a government-to-government agreement. U.S. Government control is accomplished through licensing by the Office of Munitions Control, Department of State. (DISAM, 1989)

b. Commercial Sales Process

A foreign purchaser will make a request for a defense item or service from a U.S. commercial source. As in the case of FMS, cost thresholds determine the amount of review U.S. Government review and approval needed to facilitate the sale. If the cost of major defense equipment is less than $14 million or the cost of other defense articles or services is less than $150 million, once Department of State review and approval for the sale has been completed, an export license will be issued.

However, if the sales involve costs exceeding those stated above, once Department of State approval has been received the President will submit a numbered certification to the Congress both describing and justifying the sale. The Congress will then have 30 calendar days to review the certification. If the Congress adopts a joint resolution objecting to the sale within this time period, an export license will not be issued. If there is no objection, an export license will be granted. (DISAM, 1989)

The primary difference between FMS and Commercial Sales has to do with the extent of Government involvement. With a FMS, the U.S. Government and the appropriate DOD agency is deeply involved from the receipt of the LOR to the delivery of the last shipment and receipt of the last bill. In Commercial Sales, U.S. Government involvement is limited to the initial approval process, after which the conduct of the sale and the extent of follow-on support is negotiated and settled between the U.S. commercial source and the foreign purchaser. Figure 2 shows a flow diagram of both the FMS and Commercial Sales Process.

C. THE USE OF OFFSETS

1. Definition

Offsets are a range of industrial compensation practices required as a condition of purchase in either government-to-government or commercial sales of defense articles and/or defense services as defined by the Arms Export Control Act (AECA) and the International Traffic in Arms Regulations (ITAR). Essentially, offsets in arms trade are arrangements which use some method of reducing the amount of currency needed to buy a military item or some means of creating revenue to help pay for it. The term "offset" refers to a range of industrial or commercial compensation practices required as a condition of sale for military related exports. The different types of offsets are:

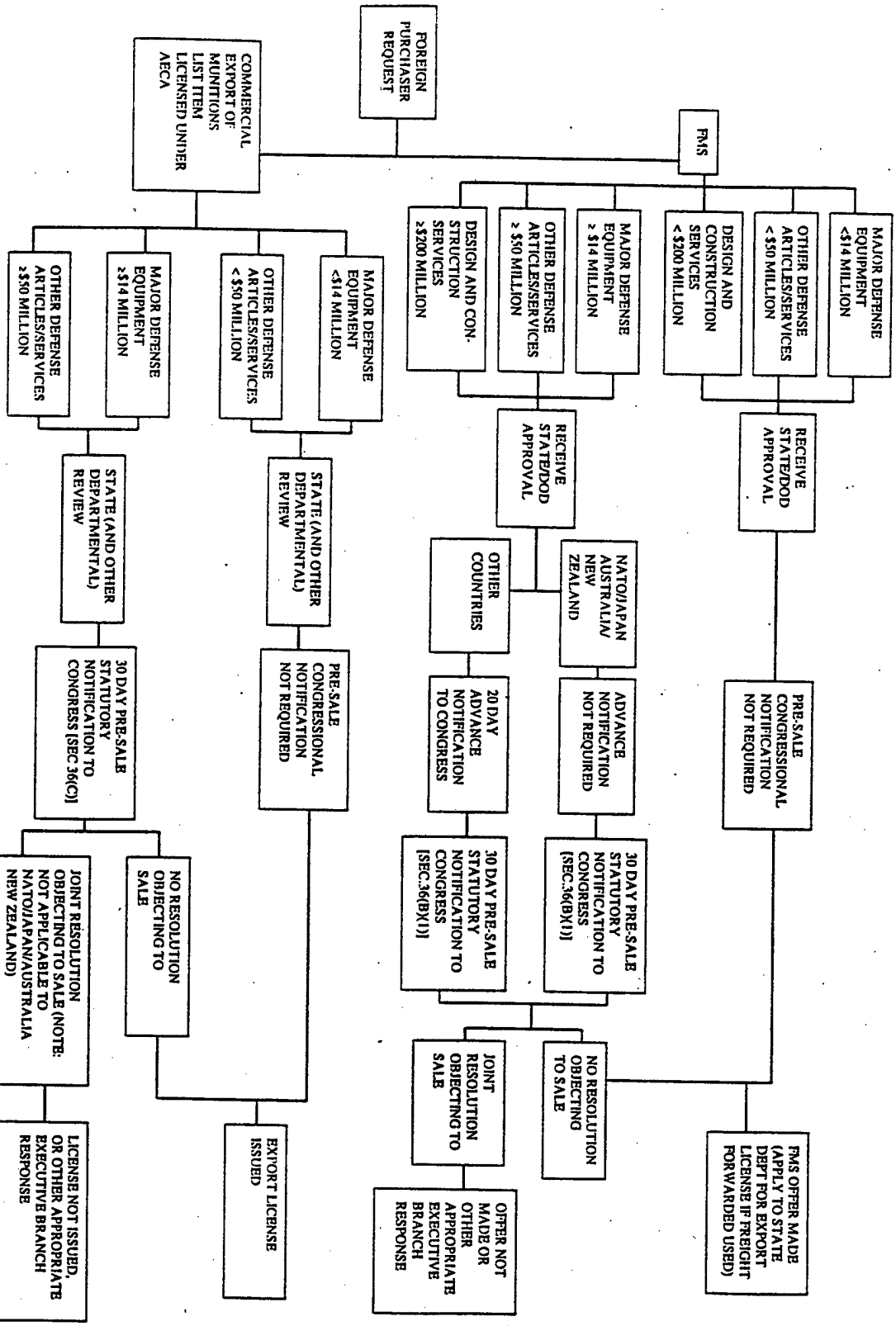

Figure 2. Flowchart of AECA Advance Sales Reporting Provisions. (DISAM, 1989)

- Coproduction: overseas production based upon government-to-government agreement that permits a foreign government or producer to acquire the technical information to manufacture all or part of a U.S. origin defense article.

- Licensed Production: Overseas production of a U.S. origin defense article based upon a transfer of technical information under direct commercial arrangements between a U.S. manufacturer and a foreign government or producer.

- Subcontractor Production: Overseas production of a part or component of a U.S. origin defense article.

- Overseas Investment: Investment arising from the offset agreement, taking the form of capital invested to establish or expand a subsidiary or joint venture in the foreign country.

- Technology Transfer: Transfer of technology that occurs as a result of an offset agreement and that may take the form of: research and development conducted abroad; technical assistance provided to the subsidiary or joint venture of overseas investment; or other activities under direct commercial arrangement between the U.S. manufacturer and a foreign entity.

- Countertrade: An agreement involving the reciprocal purchase of civil or defense goods and services from the foreign entity as a condition of sale of military-related exports.

- Counterpurchase: An agreement by the initial exporter to buy (or find a buyer for) a specified value of unrelated goods from the original importer during a specified time period.

- Compensation: An agreement by the original exporter to accept as full or partial repayment products derived from the original exported product. (DISAM, 1989)

Offsets associated with military exports are further divided into two primary classifications:

- Direct Offsets: Contractual arrangements that involve goods and services referenced in the sales agreement for military exports.

- Indirect Offsets: Contractual arrangements that involve goods and services unrelated to the exports referenced in the sales agreement.

2. Background on the Use of Offsets

Since World War II, U.S. defense industries have been major players in the international arms market. Coproduction in the defense trade was initially encouraged by the U.S. Government to help re-build the war ravaged economies and industrial bases of Western Europe and Japan. Co-production and licensed production of U.S. weapons systems in foreign countries began in the late 1950's and early 1960's, with the NATO countries and Japan being the first countries to receive these production agreements. (DISAM, 1989)

During the Cold War it was in the best interests of the United States to ensure that allied countries were strong militarily as well as economically. Offsets helped achieve important foreign policy and national security objectives of the U.S. such as increasing the industrial capabilities of allied countries, standardizing military equipment, and modernizing allied forces.

The use of offsets is now commonplace. Undersecretary of State Lynn Davis noted, "The demand for offsets is growing, with practically every arms purchaser demanding some form of offset" (F.A.S., 1994). Virtually all of the defense trading partners of the U.S. impose some type of offset requirement, and at times the stated value of the offset exceeds that of the sales contract. Countries require offsets for a variety of reasons: to ease the burden of large defense purchases on their economy; to increase or preserve domestic employment; to obtain desired technology; and to promote targeted industrial sectors. Many defense contractors report that they must fulfill these demands or risk losing a valuable sale. In fact, many times defense exporters can not even submit

a bid proposal unless it includes an offset package. Further concerns are raised by the use of offsets: is it adversely effecting the U.S. defense industrial base; what are the effects on U.S. employment; are offsets having a negative effect on the competitive position of U.S. defense industries; is U.S. national security being jeopardized by any transfers of technology associated with the use of offsets? Both the increased use of offsets, their effects on U.S. trade, employment, and global competition, and U.S. industry's reactions to offsets will be analyzed in Chapters III and IV of this thesis. (DISAM, 1989)

3. U.S. Government Policy on the Use of Offsets

Until 1978, the Department of Defense negotiated offset arrangements between U.S. military equipment manufacturers and other countries in connection with FMS. However, the increasing difficulties associated with administering offsets and the increasing pressure allies were bringing to bear for offsets led to the 1978 Duncan Memorandum. Issued by Deputy Secretary for Defense Charles Duncan, it specified that the Department of Defense would not be a party to satisfy commitments for offsets or compensatory coproduction. The memorandum stated:

> Because of the inherent difficulties in negotiating and implementing compensatory coproduction and offset agreements and the economic efficiencies they often entail, DOD shall not normally enter into such agreements. An exception will be made only when there is no feasible alternative to ensure the successful completion of transactions considered to be of significant importance to the United States national security interests. (DISAM, 1989)

This became the guiding principle in the formation of the U.S. Government's current policy regarding offsets.

The U.S. Government policy on offsets is that "it is DOD policy not to enter into government-to-government offset arrangements because of the inherent difficulties in negotiating and implementing such arrangements" (DISAM, 1989). However, DOD will not prohibit a defense contractor from negotiating and implementing its own offset agreement with a foreign government. Additionally, concerned with the potential political impact that offsets could have on the competitive position of U.S. industries, the Congress passed a bill in 1984 that became an amendment to the Defense Production Act (PL 98-265) requiring the President to report annually on the impact of offsets on U.S. defense preparedness, industrial competitiveness, employment, and trade. Further Congressional action took place in 1989 when Congress addressed the issues of technology transfer and their affects on specific sectors of the U.S. industrial base. It required the President to enter into negotiations with foreign countries that have a policy of requiring offset arrangements in connection with the purchase of defense equipment or supplies from the United States in order to achieve an agreement to limit the adverse effects such arrangements have on the defense industrial base of each country. It also recommended that a national policy be established with respect to contractual offset arrangements. Further discussion and analysis of the role of the U.S. Government regarding offsets will be conducted in Chapter V of this thesis. (DISAM, 1989)

D. SUMMARY

This chapter has traced the history of U.S. security assistance policy and practice from its early days in the Revolutionary War to today. It has illustrated how this policy

has contributed to both U.S. foreign policy and the national security of the United States. With the emergence of the United States as a superpower after World War II and the commensurate desire to contain communism, security assistance grew and became a major component of U.S. foreign policy. Increased congressional concern over the escalating level of arms sales led to the Foreign Assistance Act and the Arms Export Control Act, charging the Executive Branch with specific responsibilities and providing for security assistance management. These Acts, as amended, legislate how security assistance is presently conducted.

The definitions and procedures for Foreign Military Sales and Commercial Sales were explained. The primary difference between these two methods of selling defense equipment or services to foreign buyers is that of U.S. Government involvement. The U.S. Government is involved in all aspects of approval and facilitation for a FMS. The U.S. Government is only involved during the approval stage for a Commercial Sale – it is then up to the commercial contractor to manage the remaining aspects of the transaction.

The concept, definition, and background of military offsets were then explained. Used originally as a method to help re-build the industrial and economic bases of Western Europe and Japan after World War II, they have evolved into a commonplace practice through which foreign purchasers can reduce the amount they are paying for an item by reducing the amount of currency needed or creating revenue to help pay for it. More and more, foreign purchasers are requiring offset provisions in every contract and U.S. contractors, needing to make a sale, are reluctantly agreeing to them. The U.S. Government's official policy is not to encourage or commit to offsets in connection with

the sale of defense goods or services to foreign governments. However, the U.S. Government will not limit the negotiating and implementing rights of U.S. industry in establishing offset arrangements with foreign buyers of U.S. goods and services. Ironically, while the U.S. Government's policy is to avoid offsets, in recent years the amount of U.S. Government oversight and monitoring of this trade practice has increased due to growing concerns regarding the effects of offsets on the U.S. defense industrial base, employment, global competitiveness, and technology transfer to other nations. An analysis of offset growth and its effects on the employment, trade, and competitiveness of the U.S. defense industrial base will be given in the next chapter.

III. ANALYSIS OF OFFSET GROWTH, THE OMB AND DOC STUDIES

This chapter will examine the trends in total, direct, and indirect offset growth. This analysis will focus on offset data collected by the Department of Commerce (DoC) from 1993-1995 although data previously collected by OMB will be presented in order to see if any long-term trends are discernable. While OMB reports covering offset growth from 1980-1987 did include analyses of how offsets impacted employment, trade, and global competition in the U.S. industrial base, the DoC's 1993-1995 reports on offsets did not include any quantitative analysis on how offsets may have impacted these areas. This chapter will discuss why the DoC did not include this analysis and methods by which these complicated relationships can be analyzed in future studies. The majority of the numerical information contained in this chapter is drawn from the 1997 DoC study of offsets in the defense trade. The source for all data presented is the DoC study unless otherwise noted. All monetary amounts have been converted into constant 1996 dollars by using the Gross Domestic Product (GDP) deflator.

A. BACKGROUND

In 1984 Congress enacted amendments to the Defense Production Act of 1950, as amended, which included the addition of Section 309. This new section required the President to submit annually to the Committee on Banking, Finance, and Urban Affairs of the House of Representatives and the Committee on Banking, Housing, and Urban

Affairs of the Senate a report on the impact of offsets on the defense preparedness, industrial competitiveness, employment, and trade of the United States.

When Section 309 was first enacted, OMB was appointed as the interagency coordinator in the preparation of the annual offsets report for the Congress. These reports were to be prepared in consultation with the Departments of Commerce, Defense, and Labor, and the Office of the United States Trade Representative. This interagency reporting requirement continued, with minor adjustments, until 1992, when Section 309 underwent major modifications. The interagency coordination role was transferred from OMB to the Secretary of Commerce. In addition, the Secretary was given the authority to develop and administer regulations to collect the offset data required for the report from U.S. industry. This responsibility was later delegated to the Department's Bureau of Export Administration (BXA). Another significant change was made in Section 309 by reducing the sales reporting threshold previously cited in the National Defense Authorization Act for fiscal year 1991 from $50 million to $5 million for U.S. firms entering into foreign defense sales contracts subject to offset agreements. On a per-transaction level, firms must report all offset transactions which exceed $250,000. The first industry reports were submitted to BXA before March 15, 1995, and covered offset transactions valued at $250,000 or more completed during calendar year 1993, as well as information regarding new offset agreements entered into during the year. After this initial submission, companies provided an additional filing by June 14, 1995, covering calendar year 1994. All subsequent annual filings will be due on June 15 of each year.

The OMB reports from 1985 to 1990 (which collected and analyzed data from 1980-1987) highlighted a growing trend in offset demands by buying countries around the world for both direct offsets (related to the weapon sale) and indirect offsets (not related to the sale, such as non-defense related investment projects). During this period, indirect offset demands expanded dramatically beyond the defense and aerospace sectors to affect other industries such as automobiles, semiconductors, software, and telecommunications. The 1990 report concludes that while offsets are an aberration of the free market mechanism, they are slightly favorable or at least neutral in their effects on the U.S. defense industrial base. From a macroeconomic level in the areas of industrial competitiveness, employment, and trade, the U.S. comes out slightly ahead.

Specifically, OMB reported that overseas military sales that contractually require offsets are likely to have a net increase in domestic employment of 2,500 employees per year. OMB admits, however, that specific contractors or subcontractors may suffer declines in domestic employment due to offset agreements; however, these declines are likely to be countered by equal or greater employment gains in other sectors of the U.S. economy. (OMB, 1990)

The OMB analysis concluded that the effect of the transactions discussed in their report had an overall positive effect for U.S. trade. The total billings of $19.8 billion in 1980-1987 compared to total offset implementations for that period of $10.7 billion. Offset agreements were strongly positive for most aerospace industries such as aircraft, radars, and aircraft engines. However, in the aircraft parts, electronic components, basic steel, and industrial machinery sectors, the net trade effects were negative. (OMB, 1990)

With regard to how offsets effect the U.S.' global position in the defense industry, OMB's study concluded that military exports and their associated offsets play a minor role in terms of the overall output of defense and non-defense industries. Where they do have an effect, they generally result in net increases in output in the most technologically advanced sectors. (OMB, 1990)

The 1990 OMB study on the effects of offsets was the most comprehensive macro-economic study conducted by any private or public organization on the subject. However, their methodology for both collecting data and arriving at their conclusions did contain serious flaws. A discussion of these flaws and possible solutions will be conducted later in this chapter.

B. DOC SURVEY RESULTS

1. Trends in Overall Offset Growth

As Table 1 shows, the percentages of offset obligations to new export contract values fluctuates widely from year to year, as do the monetary values of the export sales contracts and offset obligations. The lowest percentage occurred in 1993 at slightly under 35 percent and the highest in 1987 at over 98 percent. New offset obligations in 1993 were $4.8 billion based on sales contracts of $13.9 billion resulting in an offset percentage of slightly under 35 percent. In 1994, new offset obligations were $2.0 billion based on on sales contracts of $4.8 billion resulting in an offset percentage of slightly under 42 percent. In 1995, offset obligations were $6.0 billion on sales of $7.4 billion resulting in an offset percentage of just over 81 percent. Just as the percentage of

offset obligations to new export contract values has grown from 1993 to 1995, so has the number of offset agreements being made. In 1993, 29 new offset agreements were report-

Offset Obligations: Selected Years (in billions)			
Year	Export Contracts	Offset Obligations	Offset Percent
1980	12.3	6.8	55.3%
1981	4.2	3.7	88.1%
1982	4	1.6	40.0%
1983	12.8	6.5	50.8%
1984	8	3.2	40.0%
1985	5.2	3.2	61.5%
1986	2.9	1.4	48.3%
1987	3.9	3.8	97.4%
1988	*	*	*
1989	*	*	*
1990	*	*	*
1991	*	*	*
1992	*	*	*
1993	13.9	4.8	34.5%
1994	4.8	2	41.7%
1995	7.4	6	81.1%

*No data collected

Table 1. Offset Obligations: Selected Years.

ed by 18 companies. In 1994, 49 new agreements were made by 18 companies. Finally, in 1995, 45 new agreements were made by 19 companies. Figure 1 graphically shows the percentage of offset obligations as compared to total export contracts. While there is a high degree of fluctuation (specifically for years 1981, 1987, and 1995), total offset offset obligations tend to remain in the 40 percent to 60 percent region of total contracts made.

As previously noted, offsets take a variety of different forms and can effect virtually any industry. Table 2 shows how selected Standard Industrial Classification (SIC) industry groups were reported in offset transactions for 1993-1995. These groups represent the largest total values of offsets reported by industry. The percentages do not

total to exactly 100 percent since there is some overlap among the different classifications. For example, SIC codes 372 (aircraft and parts) and 3731 (ship building and repair) are both included under code 37 (transportation equipment).

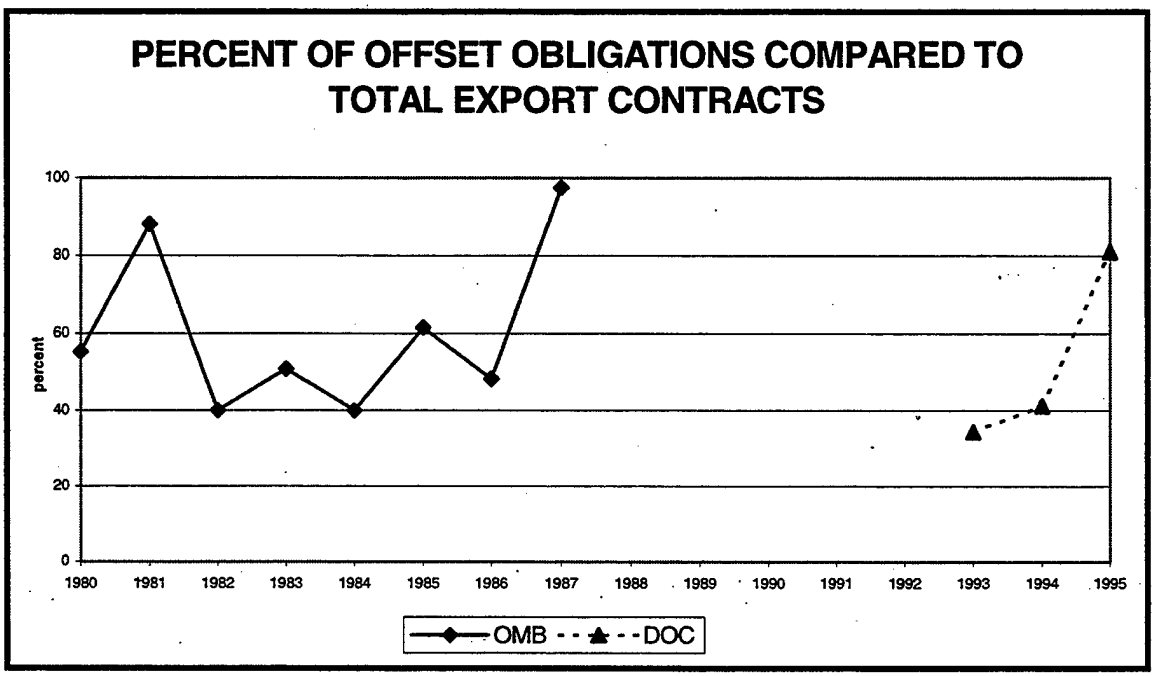

Figure 3. Offset Obligations Compared to Total Export Contracts.

Selected SIC Industry Groups Reported in Offset Transactions, 1993-1995				
SIC Code	**Industry Description**	**# of Trans.**	**Actual Value**	**% of Total**
37	Transportation Equipment	733	3,310,540,080	50.9%
Many	Aerospace related products and services	752	3,230,105,780	49.6%
372	Aircraft and Parts	684	2,786,373,831	42.8%
36	Electrical Machinery and Equipment	290	831,037,382	12.8%
35	Industrial Machinery, except Electrical	223	649,449,413	10.0%
367	Electronic Components	198	545,223,047	8.4%
61	Bank Credit	25	390,013,427	6.0%
3731	Ship Building and Repair	20	346,683,000	5.3%
366	Communications Equipment	35	139,703,152	2.2%
Percentages do not total to 100 because there is overlap among the SIC codes shown.				

Table 2. Selected SIC Industries Reported in Offset Transactions, 1993-1995.

Table 3 presents an overview of industry related transactions by offset type for 1993, 1994, and 1995. As discussed in Chapter 2, offset requirements can be fulfilled in a number of ways. Table 3 categorizes these offset types as purchase, technology transfer, co-production, subcontractor activity, training, licensed assembly, credit transfer, investment, and others. The "others" category includes marketing assistance, equipment maintenance agreements, rentals, and other miscellaneous items. Important to note here is that actual offset transactions deal with the fulfillment of agreements made in previous years. Therefore, the great majority of the offset transactions illustrated in Table 3 are not connected with the new offset obligations shown in Table 1 and Figure 2. Table 3 illustrates that total offset transactions had a slight increase of approximately 2 percent from 1993 to 1994 and then a substantial increase of 38 percent from 1994 to 1995. Many categories experienced significant fluctuations throughout the 1993-1995 period. This is primarily due to three reasons: 1) there were relatively few transactions in 1994, so a single large contract greatly impacted the values for that year; 2) the steady attrition of transactions on completed older agreements; and 3) an increase in new offset transactions. Figure 3 and Table 3 illustrate that both new offset obligations and the actual offset transactions executed to fulfill existing obligations are showing an increasing trend for the period 1993-1995. This increasing trend can be explained by both an increase in the demand for offsets and an increase in the length and amount of the offset transactions.

Total Offset Transactions by Type, 1993-1995 Actual Transaction Values, in $000s								
	1993		1994		1995		1993-1995	
Offset Type	Value	% of Total	Value	% of Total	Value	% of Total	Grand Total	% of Total
Purchase	665,839	35.1%	601,701	31.1%	818,813	30.6%	2,086,353	32.1%
Subcontractor Activity	375,919	19.8%	360,323	18.6%	824,011	30.8%	1,560,253	24.0%
Credit Transfer	278,221	14.7%	3,494	0.2%	374,248	14.0%	862,800	13.3%
Technology Transfer	183,307	9.7%	462,569	23.9%	216,924	8.1%	655,962	10.1%
Other	119,840	6.3%	149,602	7.7%	127,881	4.8%	397,323	6.1%
Training	167,994	8.8%	107,912	5.6%	104,645	3.9%	380,552	5.9%
Investment	34,358	1.8%	92,405	4.8%	117,152	4.4%	243,915	3.8%
Co-production	35,550	1.9%	111,895	5.8%	85,887	3.2%	233,332	3.6%
Lic. Prod. Assembly	37,851	2.0%	45,424	2.3%	5,110	0.2%	88,385	1.4%
Total	**1,898,880**	**100%**	**1,935,325**	**100%**	**2,674,671**	**100%**	**6,508,875**	**100%**

Table 3. Total Offset Transactions by Type, 1993-1995.

a. Growth in Offset Demand

The increasing trend in total offset growth is the result of increases in both the number of countries demanding offsets and the growing offset obligation level that countries are demanding when negotiating a sale. Most foreign countries now require offsets as a matter of policy. Additionally, many countries see the use of offsets as a tool in pursuing their own industrial policies. Via various offsets, purchasing countries can acquire new technology, maintain domestic employment, create their own national industrial base, and also acquire new markets for their own goods. (GAO, 1996)

Some arms purchasers also claim that trade restrictions imposed by the United States and other arms-producing countries necessitate the establishment of offset policies in order to ensure that their own defense industries are given an equal opportunity to compete. While the United States does not require offset requirements for

its own military purchases it does have policies that favor domestic production. For example, the Defense Production Act of 1950 allows the Secretary of Defense to preserve portions of the domestic military industrial base by restricting purchases of critical items from foreign sources. Regulations implemented by the Buy America Act of 1993 allow price preferences for domestic manufacturers. Annual DoD appropriation acts sometimes contain certain prohibitions on foreign purchases of specific products. In response to some of these obstacles to free trade, offsets are used as a means to maintain a country's own industrial health. (GAO, 1996)

Therefore, both the increase in the quantity of arms-purchasing countries requiring offsets and the increase in offset obligations demanded by these countries has contributed to the increase in total offsets. This can be expected to continue as long as foreign purchasers see the use of offsets as both a tool to bolster their own economy and as a protectionary device used to shield their own defense businesses from perceived unfair competition

b. Increase in Offset Transactions

Another trend shown by current data is that actual offset transactions are also increasing. That is, U.S. industry's spending to fulfill agreements made in previous years continues to rise. Whereas countries used to allow companies to meet offset obligations with a one-time purchase of a country's goods or a one-time investment, there is now a greater emphasis on longer term projects and commitments. This can be expected to continue. Foreign countries are now beginning to view offset deals and commitments as not only beneficial for a particular sale but also as a long-term strategy

through which they can bolster their own economy. Thus, they will require both offsets that are of higher value and longer term. (GAO, 1996)

2. Direct vs. Indirect Offset Growth

a. Direct Offset Growth

Table 4 shows that direct offsets were $582.4 million in 1993, rose to almost $600 million in 1994, and then increased sharply to nearly $1.1 billion in 1995, growing almost 83 percent during the 1993-1995 review period. As a percentage of total actual offset values, direct offsets were 33 percent in 1993, 34 percent in 1994, and almost 40 percent in 1995. The percentage increase of direct offsets in 1995 is attributable in part to corrections to the categorizations of certain reported transactions. The 1995 table includes the "purchase" transactions solely as indirect offsets and the "sub-contractor activity" solely as direct offsets. The "licensed production" and "co-production" transaction types are also categorized solely as direct offsets. These groupings were divided between direct and indirect offsets in the 1993 and 1994 data because of apparent mislabeling in the survey responses. If offset activities had been properly categorized each year, there may have not been such a dramatic increase from 1994 to 1995. Table 5 shows the ratio of direct offset to total offset transactions. Figure 4 shows this relationship graphically. Historically, direct offsets comprise approximately 40 percent of total offset transactions.

Direct Offset Transactions by Type, 1993-1995 Actual Transaction Values, in $000s								
	1993		1994		1995		1993-1995	
Offset Type	Value	% of Total	Value	% of Total	Value	% of Total	Grand Total	% of Total
Purchase	104,694	18.0%	93,003	15.5%	0	0.0%	197,697	8.8%
Subcontractor Activity	178,570	30.7%	146,139	24.4%	824,011	77.4%	1,148,720	51.1%
Credit Transfer	0	0.0%	494	0.1%	3,511	0.3%	4,005	0.2%
Technology Transfer	64,943	11.2%	114,494	19.1%	110,120	10.4%	289,557	12.9%
Other	164,372	28.2%	50,913	8.5%	23,618	2.2%	238,903	10.6%
Training	9,588	1.7%	46,602	7.8%	11,871	1.1%	68,061	3.0%
Investment	25,834	4.4%	33,302	5.6%	5,110	0.5%	64,246	2.9%
Co-production	34,435	5.9%	111,170	18.5%	85,887	8.1%	231,492	10.3%
Lic. Prod. Assembly	0	0.0%	3,850	0.6%	0	0.0%	3,850	0.2%
Total	**582,437**	**100%**	**599,967**	**100%**	**1,064,128**	**100%**	**2,246,532**	**100%**

Table 4. Direct Offset Transactions by Type, 1993-1995.

b. Indirect Offset Growth

Table 6 presents the indirect offset figures for the 1993-1995 period. These statistics show that the dollar value of actual indirect offsets rose from just under $1.2 billion in 1993 to about $1.6 billion in 1995, an increase of 35 percent. As mentioned earlier, the 1995 data is somewhat altered from that collected for 1993 and 1994 because reported purchase transactions are shown as indirect offsets only. Table 7 shows the ratio of indirect offsets to total offset transactions. Figure 5 shows this relationship graphically. Indirect offset transactions comprise the the majority of all offset transactions, maintaining a consistent level of approximately 60 percent.

Direct Offset Transactions: Selected Years (in billions)			
Year	Total Offset Trans.	Direct Offset Trans.	Direct Offset %
1980	0.9	0.1	11.1%
1981	1	0.3	30.0%
1982	0.9	0.4	44.4%
1983	1.3	0.4	30.8%
1984	1.8	0.7	38.9%
1985	2.1	0.8	38.1%
1986	3	0.9	30.0%
1987	3.6	1	27.8%
1988	*	*	*
1989	*	*	*
1990	*	*	*
1991	*	*	*
1992	*	*	*
1993	1.9	0.6	31.6%
1994	1.9	0.6	31.6%
1995	2.7	1.1	40.7%

*No data collected

Table 5. Direct Offset Transactions: Selected Years.

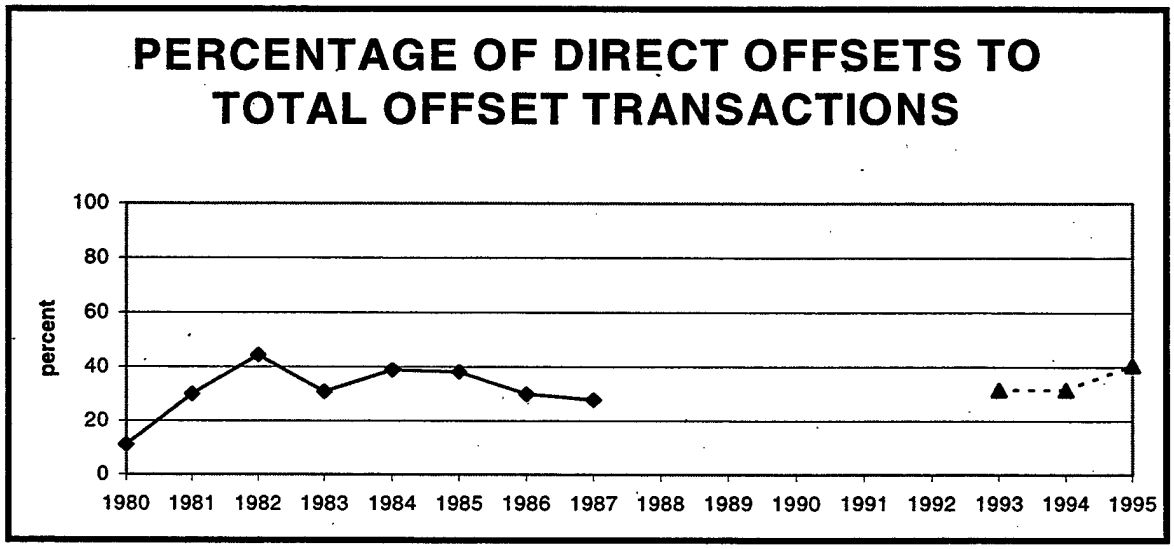

Figure 4. Percentage of Direct Offsets to Total Offset Transactions.

c. Analysis of Direct vs. Indirect Offset Growth

Despite some of the wide fluctuations in total offset obligations, how these obligations are finally executed maintains a consistent pattern – indirect offsets comprise

the majority of payment means. The ratio between direct and indirect offsets consistently remains at approximately 60/40.

The types of offsets required by buyer countries depend upon their offset program goals which, in turn, are driven by their industrial and economic development needs. Generally, countries with established defense industries (for example, Canada and

Indirect Offset Transactions by Type, 1993-1995
Actual Transaction Values, in $000s

	1993		1994		1995		1993-1995	
Offset Type	**Value**	**% of Total**	**Value**	**% of Total**	**Value**	**% of Total**	**Grand Total**	**% of Total**
Purchase	518,045	43.5%	462,110	39.3%	818,813	50.8%	1,798,968	45.3%
Subcontractor Activity	179,348	15.1%	204,159	17.4%	0	0.0%	383,507	9.6%
Credit Transfer	278,221	23.3%	3,000	0.3%	370,737	23.0%	651,958	16.4%
Technology Transfer	91,131	7.7%	285,075	24.3%	106,804	6.6%	483,010	12.2%
Other	3,622	0.3%	56,999	4.9%	81,027	5.0%	141,648	3.6%
Training	110,252	9.3%	103,000	8.8%	116,010	7.2%	329,262	8.3%
Investment	0	0.0%	105	0.0%	0	0.0%	105	0.0%
Co-production	0	0.0%	725	0.1%	0	0.0%	725	0.0%
Lic. Prod. Assembly	9,758	0.8%	59,255	5.0%	117,152	7.3%	186,165	4.7%
Total	**1,190,378**	**100%**	**1,174,428**	**100%**	**1,610,543**	**100%**	**3,975,349**	**100%**

Table 6. Indirect Offset Transactions by Type, 1993-1995.

the United Kingdom) are using offsets to help channel work to their defense or aerospace companies. Often these offsets are related to the weapon system being acquired (i.e., direct offsets) but may also involve unrelated defense projects. Countries with developing defense and commercial industries (for example, South Korea or Taiwan) pursue both defense and non-defense related offsets that emphasize the transfer of high technology in either defense or comparable high technology industries. Countries with less industrialized economies (for example, Kuwait or Saudi Arabia) often pursue indirect

offsets as a method of fostering foreign investment, creating viable commercial businesses, or building the country's infrastructure. Direct offsets are not usually pursued because these countries have limited defense and other advanced technology industries. (GAO, 1996)

Indirect offsets can be expected to maintain the majority share of total offsets obligations and transactions. More countries with less developed economies and defense industrial infrastructures are purchasing weapons systems from United States' defense firms. For these countries, indirect offsets are more useful to their economic and industrial goals than direct offsets. Indirect offsets are seen as both a method by which they can reduce the total cost of a purchase and also a tool via which they can help spur growth in non-defense related sectors of their economy. While nations possessing a more mature defense industrial base may desire more direct offsets, they also see the advantages that indirect offsets can give to their economy. All arms purchasers can utilize the benefits of indirect offsets while direct offsets are useful to only a fraction of this group.

C. ASSESSING THE IMPACTS OF OFFSETS

As noted above, the DoC reports on offsets did not contain analyses on the impact that offsets have on U.S. employment, labor, and trade. This is significant in that one of the primary purposes of this report, as mandated by Section 309 of the Defense Production Act of 1950, as amended, is to track how offsets affect these areas of the U.S.

Indirect Offset Transactions: Selected Years (in billions)			
Year	Total Offset Trans.	Indirect Offset Trans.	Indirect Offset %
1980	0.9	0.8	88.9%
1981	1	0.7	70.0%
1982	0.9	0.5	55.6%
1983	1.3	0.9	69.2%
1984	1.8	1.1	61.1%
1985	2.1	1.3	61.9%
1986	3	1.4	46.7%
1987	3.6	2.3	63.9%
1988	*	*	*
1989	*	*	*
1990	*	*	*
1991	*	*	*
1992	*	*	*
1993	1.9	1.2	63.2%
1994	1.9	1.2	63.2%
1995	2.7	1.6	59.3%

*No data collected

Table 7. Indirect Offset Transactions: Selected Years.

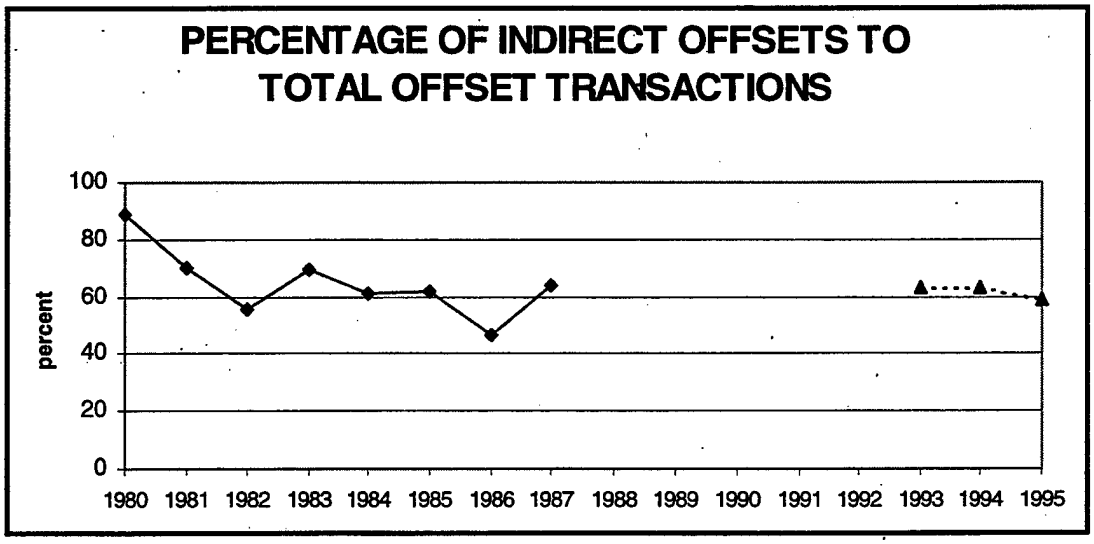

Figure 5. Indirect Offsets as Compared to Total Offset Transactions.

industrial base. DoC does not conduct analyses similar to OMB because of inherent flaws in both the data collection and methodology OMB utilized. Additionally, OMB did not release the raw forms of their data taken from 1980-1987 to DoC, preventing DoC

from maintaining a historical database through which it could track any types of long term trends. As a result of the methodology errors dicussed below, DoC did not concur with OMB's 1990 prior to its release. When responsibility for completing this annual report was transferred from OMB to DoC in 1992, the U.S. Congress waived the requirement that the report address the specific issues of offset impact on employment, labor, and trade (DOC, 1998). However, considering both the public and Congressional attention this practice receives, it would be beneficial to quantify its effects on the U.S. industrial base. The following paragraphs will both explain the specific flaws of OMB's analysis and methods through which in-depth studies of offset impacts may be conducted in the future.

1. Methodology Errors

When deriving offset impacts on employment, OMB relied upon prime contractors' estimates of the employment effects of particular sales. The questionnaires prime contractors completed for the survey asked only for estimated direct employment effects within their facilities. It did not ask these industries to estimate any indirect effects offsets may have caused on their employment. Secondary and lower tier subcontractors were not solicited for this analysis. All of OMB's estimates were dependent upon the prime contractors supplying accurate employment data. However, it had to be assumed that the employment data submitted by prime contractors would be presented in a light favorable for their own purposes. When attempting to derive estimates on indirect employment effects, the accuracy of the data received from the primes once again affected results.

After collecting employment data, OMB used an Input-Output (I-O) table with the aid of output labor ratios. An I-O table is an economic analysis technique developed by Wassily Leontief in the early 1930's which identifies and quantifies the interactions between various sectors of the economy (either a regional, national, or global economy). I-O analysis also shows the patterns of interindustry linkages and the relationships between final demand sectors and payment sectors (J. Walter, 1998). This enables researchers to examine the impacts of external shocks, policy measures, or large projects on an economy (for a further explanation on I-O tables, see Appendix A). The I-O table used in the OMB study, however, was out of date and ignored relationships between employment and 1) relative price changes over time; 2) response to technological change; and 3)economies of scale. Despite these weaknesses in both the data collection and analysis tools, OMB arrived at the conclusions discussed earlier in this chapter. OMB acknowledged some of the shortcomings in their analysis, but stated that their results would not significantly change if they re-contacted the companies and had them re-estimate the data using some sort of consistent methodology. (OMB, 1990)

When estimating the effect of offsets with regards to the trade position of the U.S., two of the primary questions OMB attempted to answer were: (1) In which industrial sectors have countries received offset obligations as a result of purchasing from U.S. defense firms and; (2) What U.S. sectors are most affected by these exports and offsets? The design of this particular analysis, however, had to take into account two substantial unknowns in the survey data. First, at the time offset agreements were made, companies often did not know the product sectors in which the concessions would occur,

especially in the area of indirect offsets. While this inconsistency primarily affected data on offset commitments, it also materialized to some extent in data on actual transactions. Second, even where the product sectors involved in the implementation of offset commitments were known, trade consequences were sometimes difficult or impossible to interpret if the specific products involved were unknown (for example, what specific products would be involved in a countertrade arrangement) or if the offsets were of a type where trade consequences were ambiguous (for example, investment or technology transfer). Although OMB was able to make a general assessment on how offsets effected trade, its conclusions are partly overshadowed by the questionable validity of their data. (OMB,1990)

OMB's 1990 report concluded that, in the area of industrial competitiveness, offsets played a virtually negligible role in the output of U.S. defense related industries and that in only five of these industrial sectors were the impacts measurable. However, in arriving at this conclusion, OMB assumed that billings for military exports always resulted in demand increases that were met by increased output of a U.S. based industry. This may not always be the case, especially if the output associated with a given billing takes place offshore (for example, in a contractor's factory that may be overseas). This tended to overestimate slightly the positive effects of offsets on industrial output. However, the minimal effect offsets had on cumulative industrial competitiveness tends to minimize this effect.

2. Improvements to the OMB Methodology

a. Data Collection

In order to determine the true extent of any positive or negative effects, both prime contractors and subcontractors in defense related industries should be solicited to submit employment and trade data when they are involved or effected, directly or indirectly, by offset agreements and transactions. Additionally, to ensure that submitted data is accurate, verification of a company's data (regardless of whether it indicates a positive or negative trend) should be required. This verification would consist of both the specific offset agreement that effected the firm and how the offset effected the employment and output of the company. Finally, if reforms were made in the data collection and methodology of an offset study, it would have to be conducted over a period of several years before any conclusions could be reached. Since offsets are increasingly being implemented over a longer period of time as foreign countries utilize them as a long-term economic strategy, the full impact of an offset on a particular industry would be ambiguous until long term trends could be established. A lengthy study would require both patience and diligence from industry and U.S. Government agencies in both the collection and analysis of data.

b. Scope

The scope of the survey would also have to be limited in order to ensure accurate results. The accuracy of any analysis is directly related to the accuracy of the data being collected. In the OMB survey, attempts were made to measure the impacts of indirect offsets using estimation methods based off of industry estimated employment

data. The results of an estimation of other estimates will not provide a high degree of accuracy. The data collected needs to be of a nature where it can be accurately measured. The specific types and amounts of any indirect offset are rarely known when an offset agreement is made. Therefore, it is extremely difficult to determine exactly what sector of the U.S. economy these indirect offsets will effect and to what degree they will do so (that is, the quantitative amount that the indirect offset will effect employment, output, and trade quantities). In order to arrive at more accurate results that are less susceptible to these uncertainties, only direct offsets should be measured in order to assess the effect on U.S. labor, trade, and competitiveness. It is far easier to measure accurately direct offsets since they are agreed to at the time of sale and because these effects are all traceable to the sale of a specific weapons system. In other words, there is a direct correlation between the sale of a U.S. weapons system and the labor and economic consequences its associated direct offsets cause. Although this assessment method would be incomplete because it would not include indirect offset effects, the impacts of direct offsets could be well established, hopefully shedding light on the overall effects of total offsets on the industrial base.

D. SUMMARY

This chapter has discussed and analyzed the current trends in overall, direct, and indirect offset growth. While the monetary amounts of total offset obligations have fluctuated, their value has consistently exceeded 40 percent of total export contracts every year except one since 1980. Data from 1993-1995 reveal an increasing trend in offset obligations. This data also shows that offsets are a significant portion of overall defense

export contracts and there is no evidence to suggest that offsets will decrease significantly in the near future. In fact, foreign purchasers now view offsets as a long-term strategy through which they can strengthen their own economy and the use of offsets as an economic tool is expected to continue. While total offset obligations have been subject to a wide degree of variability, the proportion of direct and indirect offset transactions has remained fairly stable (approximately a 40/60 split). The popularity and protracted use of indirect offsets can be expected to continue since many of U.S. industry's foreign customers are not solely intent on building their domestic defense industries. Depending on a country's level of economic development and long term economic goals, they may prefer to use indirect offsets to strengthen the non-defense sectors of their economy.

The results of the OMB's 1990 survey on offsets were explained as were the inaccuracies in their data collection and methodology. Because of these inaccuracies, the difficulty in tracking the effects of offsets on subcontractors, and the absence of a reliable model through which to measure the quantitative effects of indirect offsets on the entire U.S. economy, DoC has not been required to provide a specific analysis on the impacts of offsets on employment, trade, and competition within the U.S. industrial base. However, improving data collection methods and narrowing the scope of the analysis may provide a more accurate assessment of the impacts of this trade practice. Although no analytical assessment has been recently completed to measure the impact of offsets on overall U.S. employment, trade, and industrial competition, recently completed industry surveys by both the Bureau of Export Analysis and the author, as documented in the next chapter, do

reveal how offsets can both positively and negatively impact industry. Both industrial impacts and industry reactions to the use of offsets will be examined in Chapter IV.

IV. INDUSTRIAL REACTIONS TO OFFSET GROWTH

A. BACKGROUND

The Bureau of Export Administration (BXA) conducted a survey of subcontractors to accompany both the 1996 and 1997 report on *Offsets in Defense Trade.* The Competitive Enhancement and Diversification Needs Assessment Survey was a voluntary survey directed towards small- and medium-sized businesses (less than 500 employees) who were subcontractors of major defense prime contractors. The survey's purpose was to gather basic information about the subcontractors' operations, including sales, employment, and exports. Collected over a period of three years ending in April, 1997, the BXA received responses from a total of 1,804 small- to medium-sized companies. The survey included the following questions about offsets and their impact on subcontractors:

- Has your firm been involved in an offset agreement?
- Has your firm been negatively affected by offset agreement practices? (For example: have you ever lost a sale because of an offset agreement, or have new competitors been created due to offset agreements?)
- Has your firm been positively affected by offset agreements?

The first question regarding offsets involvement was not restricted to only meaning that the firm participated in the formulation of offset agreements with an arms purchaser. It could also be interpreted as meaning that the firm was involved at arms length without any real control over the terms of the agreement. (DoC, 1997)

To augment this data, the author conducted personal interviews with representatives from 11 different sized firms during July and August of 1998. Four of these firms (The Boeing Company, Bell-Textron, United Defense, and Hughes Missile Systems) were very large, all in excess of 30,000 employees and were involved in the aerospace, helicopter, ground vehicle, and missile sectors of the defense industry. Additionally, representatives from seven small- to medium-sized businesses (less than 500 employees) were also interviewed regarding their company's exposure to offsets. These companies (Quantic Industries, Aero-Gear Incorporated, American Precision Industries, Dynamic Controls Corporation, Aero-Tech Support Systems, B&E Tool Company, and Luminescent Systems Incorporated) were involved in a variety of business areas, including ordnance, aviation engine components, luminescent lighting manufacture, electrical connectors, and aerospace gears manufacturers. The questions for these interviews included those from the BXA survey and the following additional questions:

- Is any type of legislation/regulation needed to control the use of offsets? How would your firm be affected by this control?
- If no changes are made in how the defense industry utilize offsets, what could be the long-term consequences for your company?
- Any additional comments.

This chapter will present both the results of BXA's survey and also some of the highlights of the author's interviews with industry (at the request of the firms interviewed, none of their spokespersons will be identified). A more in-depth summary of the interviews is contained in Appendix B. Based on these results, trends will be noted

on how offsets are impacting defense industry firms in the areas of employment, trade, and competitiveness. Finally, this chapter will conclude with descriptions of how offsets have affected two specific sectors of the defense industry: the machine tool industry and the aerospace gear industry.

B. BXA SURVEY RESULTS

The results of the 1996 BXA study were taken from a sample of 1,151 small- to medium-sized companies that responded to the survey. Of these companies, 987 indicated some sort of involvement in offset agreements with 148 of these directly involved in the formulation of the offset agreement. Two hundred and two companies (20 percent of the companies who reported any degree of involvement in offsets) reported being impacted either positively or negatively by offsets. One hundred and sixty-eight (17 percent) of these companies reported that offsets effected them negatively while 34 (3.4 percent) indicated that offsets effected them positively. When discussing the negative or positive effects of offsets, negative effects include those that result in decreased work orders, sales, and competitiveness for the firm. Many of the firms also reported that they would have to reduce their workforce as a result of these negative effects. Positive effects included an increase in work orders, sales, and increased access to new markets.

In 1997 an additional 703 surveys were received by the BXA. Six hundred and fifty-nine companies (94 percent of the 1997 survey population) indicated some degree of involvement in forming the offset agreement. One hundred and fourteen companies in the 1996 survey reported that their businesses were impacted by offsets, 25 positively and

89 adversely. Table 8 presents the overall categorical summary of responses to both the 1996 and 1997 surveys (percentages in the right columns are based on the total responses to the offset questions). (DoC, 1997)

BXA Needs Assessment Survey Responses to Offset Questions				
	# of Firms Reporting		Percent Distribution	
RESPONSE CATEGORY	1996	1997	1996	1997
Total Survey Population	1151	703		
Total Responding to Offset Questions	987	659	100.00%	100.00%
Total Reporting Direct Offset Involvement	148	45	15.00%	6.80%
Total Reporting Impacts:				
Total Reporting Negative Impact	168	89	17.00%	13.50%
Total Reporting Positive Impact	34	25	3.40%	3.80%

Table 8. BXA Needs Assessment Survey Responses to Offset Questions.

BXA's survey also used company data in order to evaluate trends with respect to defense sales as a portion of total revenue. This information was calculated based on firms that reported defense business. This included 967 companies out of the 987 that responded to the 1996 survey and 512 companies out of the 659 responses received in 1997. The average defense business share of the population was 36.7 percent in 1996 and 32.9 percent in 1997. Those companies reporting a negative offset impact had an average defense share of business of 50.1 percent in 1996 while in 1997 the companies reporting a negative offset impact averaged 43.4 percent defense shares, a decrease of 6.7 percent. Companies reporting positive impacts had their defense shares drop from 57.3 percent in 1996 to 45.9 percent in 1997, a decrease of 11.4 percent. This data reflects a trend that smaller businesses, on average, have experienced a reduction in defense generated revenues and business over the two-year period (DoC, 1997). While BXA's survey was inconclusive as to the exact nature of this decrease in defense-related business (whether due to downsizing, fewer U.S. Government contracts, or an increase in Government

orders going overseas due to offsets), it can be concluded that small- and medium-sized businesses will face increased competition to obtain defense contracts in a smaller defense-related market. Therefore, any future adverse economic effects due to offset practices will have increasingly negative impacts for these businesses. Additionally, the percentage of defense revenues for those companies involved in offset agreements showed a slight increase, indicating that firms with greater defense shares are more likely to be involved or impacted by offsets. This may reflect a trend that companies will have to become increasingly involved in offset agreements as a matter of practice if they want to ensure that a large portion of their revenues come from the defense sector. Table 9 summarizes this data.

Relationships of Offsets to Defense Sales				
	Number of Firms		% Defense Revenues	
Offset Response Category	1996	1997	1996	1997
Total Population Reporting Defense Sales	967	512	36.70%	32.90%
Negative Impact	160	83	50.10%	43.40%
Positive Impact	33	22	57.30%	45.90%
Involvement	143	42	48.40%	49.60%

Table 9. Relationships of Offsets to Defense Sales.

Table 10 shows the data used to derive the relationship of offsets to employment. Average employment for the total population of firms responding to the BXA survey was 105 in 1996 and 80 for 1997. As can be seen by comparing the employment figures for positively impacted and negatively impacted firms in both 1996 and 1997, positively impacted firms are much larger in terms of average employment than negatively impacted firms. This may indicate that smaller firms are more susceptible and, therefore, more likely to be negatively impacted by offsets than larger firms. However, it may also mean

that larger firms have other business, more oversight, greater influence over the design and implementation of the offset, or that prime contractors recognize the larger firms as critical first tier subcontractors and, not wishing to jeopardize this relationship, design the offset to be less harmful to larger subcontractors. (DoC, 1997)

Relationship of Offsets to Employment				
	Number of Firms		Avg. Employees	
Offset Response Category	1996	1997	1996	1997
Total Population Reporting Employment	967	636	105	80
Negative Impact	164	85	165	93
Positive Impact	33	23	274	156
Involvement	145	42	242	237

Table 10. Relationships of Offsets to Employment.

The results of BXA's survey tend to support the hypothesis that companies with larger defense markets and more employees are more likely to be involved directly and impacted by offsets. This could appear to mean that offsets generally impact larger subcontractor firms more than smaller ones. If this is indeed the case, there may be several explanations as to why smaller firms would be less impacted:

1) Smaller firms may have a degree of immunity. For example, the scale of their operations would make offsetting less efficient, and thus less desirable.

2) Smaller firms may not recognize the impact. Communications beyond their immediate customer (the prime or a higher level sub-contractor) may be poor or non-existent.

3) Smaller firms are versatile and offsets 'do not matter. Offsets are irrelevant to their success; business opportunities are available elsewhere. (DoC, 1997)

Of the four prime defense contractors interviewed, all of them indicated major involvement in the design and implementation of offsets. None of them indicated great

enthusiasm for this marketing tool and, in fact, would rather prefer to do what they do best – produce their particular product – and get paid in cash. However, they admitted that establishing and implementing offset agreements was a business practice they had to do in order to stay competitive. All of them indicated that offsets were beneficial for their companies in that they enabled them to conduct business in the international market. Of the seven smaller defense subcontractors interviewed, two stated that their companies were directly involved in some type of offset arrangement while five acknowledged that their business was being impacted by offsets. Six of these smaller companies were being negatively impacted (loss of orders, market share, or adverse employment effects) by offsets while one of the companies stated that offset agreements had positively effected business (an overseas market had opened up for their product).

C. OFFSET IMPACT ON EMPLOYMENT

1. Large Firms

Large firms (defined as firms with more than 500 employees although the large firms referred to in this thesis had more than 30,000 employees) acknowledge that offsets will inevitably transfer some jobs overseas which otherwise would have been performed in the United States. However, they argue that offsets help preserve American jobs since without the offsets, the sale itself could have very likely gone to an overseas producer, resulting in no work creation in the U.S. Not only do they create some U.S. jobs, they can also extend production runs resulting in longer-term employment for U.S. workers (GAO, 1996). By sacrificing some U.S. jobs they were able to retain others. (Johnson, 1987). For example, in 1992 McDonnell Douglas claimed that if 72 F-15E military aircraft were

not sold to Saudi Arabia, 40,000 jobs would be lost due to shut down production lines and the loss of other general support jobs. The aircraft firm used this argument to help them gain Congressional approval for the sale (FAS, 1994). It must be noted, however, that overseas sales facilitated by offsets can lead to the creation of export-related American jobs including maintenance of defense system production lines, the manufacture of additional spares, and the providing of services over the lifetime of the exported hardware. Conversely, potential exists for offsets to lead to the loss of domestic jobs via uneconomic coproduction or licensed production agreements resulting in manufacturing performed overseas (DoC, 1996). As one interviewed large business spokesman said, "Our company does not like sending some of these jobs away from U.S. workers but what is the alternative? Without some of these offset agreements, there may be no work at all" (Bell-Textron Spokesman, 1998).

2. Medium and Small Firms

In contrast to the position of large firms, medium and small firms overwhelmingly argue that the use of offsets has adversely affected domestic employment. They argue that the large defense contractors who make the offset agreements do not feel the brunt of the agreement's consequences. Large defense companies will not agree to offset provisions that leave them worse off than they were prior to the agreement. Oftentimes, the lower tier subcontractors are on the receiving end of the offset agreements in the forms of lost business. These smaller companies claim that offset agreements transfer subcontracting work to overseas firms, result in co-production agreements that reduce the domestic demand for jobs, and require American prime contractors to source parts from

overseas (DoC, 1997). As one medium-sized business spokesman said, "Offsets have taken work out of our shop and put it into other countries around the world" (Aero-Gear, Inc. Spokesman, 1998) Of the seven small- to medium-sized businesses interviewed, six stated that they had experienced reductions in employment in the last five years. While not all of these reductions were solely due to offsets, the companies reported that increased use of offsets at either their level or the prime contractor level had adversely effected their market share and, thus, their employment. There are also long-term employment effects from offsets. As foreign countries reap the advantages of various offsets such as technology transfer and co-production and develop their own domestic manufacturing capability, the creation of overseas competitors will have long term effects on U.S. employment opportunities. One small business stated that offsets are effecting current job opportunities, "Offshore competitors have literally been put into business to compete against us." He continued, "Offsets typically create competitors in a prospective market, obstructing future business into the region" (B&E Tool Company Spokesman, 1998). Not only are offsets adversely affecting current defense industry employment, they may also effect future employment since entry into potential markets may be more difficult. Additionally, offsets can adversely effect the employment in non-defense related industries who lose business because of indirect offsets (FAS, 1994).

D. OFFSET IMPACT ON TRADE

1. Large Firms

Large firms contend that offsets benefit the U.S. balance of trade since they enable U.S. defense companies to make sales to foreign purchasers and export their products.

They also argue that if they were restricted from offering offsets to potential purchasers, customers could simply find another firm to do business with, adversely effecting the U.S. trade balance if these customers went to an overseas business. As one company spokesman said in a recent interview, "We're worried about potential customers going somewhere else for a product. Sixty percent of something is better than 0 percent of nothing" (Boeing Spokesman, 1998). Additionally, they argue that for every export, at some time and place there must be an import of equal value. Thus, over time the U.S. will gain back any trade that it loses as a result of offsets (Johnson, 1988). Offset opponents have also claimed that technology transferred as a result of offset agreements could be used by the recipient country not only in the immediate undertaking but ultimately to produce products that will compete with similar U.S. products in the world economy, potentially eroding the America's trade balance even further. Large firms contend that this is not a major problem:

> As already noted, companies are very aware of the importance of maintaining a technological edge over the competition. The best way to do that is not through guarding current technology, but by always having new and better technologies under development. By the time the technology is made available through an offset and actually employed overseas, the U.S. firm is almost certain to be incorporating even newer technology in its own production processes. (Johnson, 1988)

Thus, large firms contend that the best way for U.S. businesses to defend their trade position is to constantly develop better products and foster a global demand for them.

2. Medium and Small Firms

Medium and small firms overwhelmingly agree that the use of offsets has had an adverse effect on their domestic and international trade. One small business spokesman

told the author, "Offset agreements have cost my company millions in lost revenue" (Aero-Tech Support Systems Spokesman, 1998). Not only have prime U.S. defense contractors switched to overseas vendors for manufacture of various parts of a weapons system, these new foreign products are increasingly replacing American made products. One U.S. subcontractor stated, "In a couple of Pacific Rim areas, competitors have established offset agreements to eliminate the sale of our product" (Aero-Gear, Inc. Spokesman, 1998). Of the seven small- to medium-sized businesses interviewed for this thesis, six reported that offsets were partly responsible for reduced orders for their products. One medium sized firm did report that the implementation of an offset agreement had actually exposed his product to international markets (Luminescent Systems, Inc. Spokesman, 1998). In some circumstances, the present facilitation of offset agreements could pose future threats to the American balance of trade. For example, Spain bid for a new main battle tank to be built in Spain so that it could export it in direct competition to the American supplier (Neuman, 1986). Perhaps the most insidious of indirect offset types that threaten America's trade balance is that of countertrade. In this situation, contractors will assist a country in finding markets for its exports, some of which will be in the United States. In this case, not only is the defense industry's balance of trade effected but other U.S. trade sectors may be adversely impacted by the import of foreign products.

E. OFFSET IMPACT ON COMPETITION

1. Large Firms

In today's markets, the United States has strong competitors for most U.S. products. In the defense arena, specifically, U.S. sales of defense equipment in the international markets has declined due to reductions in arms purchases both within the U.S. and abroad. Additionally, new arms suppliers have emerged in the marketplace. Other arms producers such as Israel and Brazil have joined traditional competitors such as the former Soviet Union and France. Faced with this environment, the use of offsets is critical for the health of the U.S. defense industry. Mr. Joel Johnson, Vice President of the American League for Exports and Security Assistance, said, "From the perspective of the U.S. prime defense contractors, in light of the current competitive international environment there is the choice between business with offsets or no business at all" (Johnson, 1988). From a seller's point of view, offsets are a way of staying competitive in order to maintain market share or improve sales. In 1994, for example, two American arms manufacturing giants – McDonnell Douglas and Lockheed – were in fierce competition for a $2 billion dollar sale of combat aircraft to Israel. Each was trying to outbid the other in terms of price, technology, and offset packages. McDonnell Douglas eventually won the contract but only after agreeing to an offset package that will benefit Israeli industry for up to 100 percent of the sale's value (FAS, 1994). Without this offset package, McDonnell Douglas would have lost the competition. One contractor told the author that, "...it is our policy not to solicit offsets. Rather, we will only agree to an offset arrangement if we are convinced that we have no other choice if we want to stay

competitive" (Boeing Spokesman, 1998). Of the four large contractors interviewed for this thesis, all four felt that offsets were a vital tool for them in order to stay competitive in the international arms market.

2. Medium and Small Firms

Medium and small firms believe that they have become less competitive in the market because of offsets. Offset agreements not only may obligate prime contractors to source labor and parts overseas, but also may assist foreign industries in their own development and enable them to compete against small and medium sized American firms both in international and U.S. markets. For example, technology transfer may potentially create foreign competitors who may then use this technology to block future component exports into their market or to enter U.S. markets. Additionally, a foreign competitor may be subsidized by its government, a common practice in many foreign markets. These factors can potentially place U.S. subcontractors at a competitive disadvantage. One contractor admitted, "...we were best in price and technical proposal but the (prime contractor) had to place contract in country where sales of new aircraft demanded that work load on that aircraft be placed in that country" (Dynamic Controls Corporation Spokesman, 1998) Another interviewed subcontractor said, "Offshore competitors have literally been put into business to effectively compete against us" (Quantic Industries, Inc. Spokesman, 1998)

F. SECTOR BREAKOUTS

1. The Effects of Offsets on the Machine Tool Industry

Machine tools are one of the most essential products supporting modern advanced economies in terms of innovation and manufacturing productivity. Despite the industry's small size, nearly all other machines used in the economy are built either directly or indirectly by machine tools. The industry is global and specialized. For each major type of machine tool, often only a handful of producers compete for business on a global basis. (DoC, 1997)

Until the 1980's, the U.S. machine tool industry was the world leader. However, this changed as Japanese, German, and other machine tool builders gained global market share, and captured large portions of the American market. The U.S. industry appears to have stabilized, although at a much lower level, in the 1990's. In 1995, the U.S. ranked first among nations in the consumption of machine tools ($6.7 billion), but third in production ($4.5 billion). The U.S. machine tool deficit in 1995 was $2.25 billion. (DoC, 1997)

Offsets appear to have had an impact on the U.S. based production in the metalworking machine tool industry (specific machine tools effected included punching presses, wire cutting machines, automatic presses, various grinding machines, turret presses, and others). Based on the annual sales volume of the U.S. machine tool industry relative to the dollar value of offset transactions, the impact is seemingly small. In fact, the total dollar value of machine tool offsets for the three years 1993-1995 was $113 million, which is less than one percent of U.S. production over this time frame.

However, the impact of offsets is not felt so much at the aggregate level as it is at the firm level. (DoC, 1997)

Offsets contribute to the large U.S. machine tool trade deficit by increasing imports or reducing U.S. exports of machine tools. The $113 million in machine tool offset transactions were primarily fulfilled in Switzerland, Finland, and Malaysia. In 1994-1995 alone, the U.S. machine tool trade deficit to Finland, a small producer ranked 21st in the world, was $33 million. The deficit with Switzerland (fifth leading producer) was over $435 million. The United States had a $36 million surplus in trade with Malaysia, but this could have been much larger had there not been two offset deals to Malaysia worth over $60 million. (DoC, 1997)

When offsets are used to influence purchasing decisions, and thereby preempt normal market forces, the loss of business will negatively impact some other global competitor. Some U.S. machine tool firms are globally competitive; these tend to be larger, and their presence in global markets makes them more vulnerable to market distortions and imperfections. Many of the U.S. firms are small, family owned businesses. In fact, about three-quarters of domestic machine tool companies employ fewer than 50 people. These smaller companies supply parts and components to the larger machine tool builders, and also stand to lose business as a result of offsets. A corollary effect is that the offsets introduced some U.S. end-user firms to new potential foreign suppliers of machine tools, relationships that will continue over time as U.S. firms attempt to fulfill offset obligations as well as bank future offset credits. (DoC, 1997)

This short case study illustrates that offset effects can be difficult to measure or even seem inconsequential at the macroeconomic level. However, when the scope of the analysis is reduced to analyzing the effects within a particular industrial sector some offset effects may be easier to identify. In the case of machine tools, offsets have had a direct impact on the position of U.S. machine tool manufacturers within the world market. Increasingly, machine tool transactions have been carried out overseas as a result of offset transactions, enabling foreign competitiors to increase their market share. Conversely, U.S. machine tool manufacturers and their suppliers, which tend to be small businesses, are losing their share of this market.

2. The Effects of Offsets on the Aerospace Gear Industry.

Gears are highly specialized items that are near the top of the spectrum in terms of mechanical complexity and manufacturing difficulty. This especially applies to aerospace gears, which are fabricated out of specialty metals to very tight tolerances. Most gear elements and components are designed and manufactured for specific end products. Thousands of customized part numbers are in use, which are difficult to replicate without the design drawings. An integrated gearbox producer makes some of the gear elements in-house and buys others, and then mounts the elements on purchased shafts with other components such as bearings and seals inside the gearbox. The gear element (referred to as an open gear) producers play a key role in the supply chain by providing the various gearbox companies with hard-to-make gear elements. The machine tools needed to produce high precision gears are specialized and expensive, and cannot be economically justified by most gearbox producers unless volume is great enough; therefore, most gear

elements are outsourced along with other components by the gearbox integrator. (DoC, 1991)

The U.S. gear sector has long relied on defense for its principle market, especially on gear systems used in military helicopters. The defense market share of the U.S. aerospace gear market was estimated at about 70 percent of the $537 million total shipments in 1991. Imports of gear elements and gearing were just over 17 percent of the U.S. market. Additionally, about 40 percent of the business was captive to defense prime contractors, notably the helicopter or gas engine turbine engine companies. For example, Sikorsky and Bell Helicopter each made gearboxes, as well as some gear elements. (DoC, 1991)

The sharp drop in U.S. defense requirements for aerospace gears had a profound impact on the industry. At least six U.S. aerospace gear manufacturers have gone out of business, including two independent major integrated gearbox producers. This has led to the increased number of captive gear companies, and further isolated the remaining open gear subcontractors. In consideration of the reduced U.S. defense market for helicopters and other aircraft, exports of these items take on greater importance as a source of revenue to prime contractors. This circumstance places open gear subcontractors in a precarious position. (DoC, 1992)

The immediate impact of offsets on the gear industry is difficult to assess and at first glance might seem slight. From 1993-1995, only one offset transaction was designated as "gears" (SIC classification) and totaled only $402,000. However, 134 offset transactions totaling $360 million were designated generically as "aircraft and

parts," offsetting U.S. prime helicopter exports. Of these, $161 million were direct offsets, of which $93 million were described as subcontractor activity. Some portion of this subcontractor activity would likely involve helicopter gears or gearing. Therefore, the reported $402,000 does not fully capture the extent of offsets in aerospace gears. The major foreign producers of aerospace gears are both larger and more globally oriented than their American counterparts. U.S. aerospace gear companies were more technologically advanced than these firms in areas such as heat treatment and grinding until the early 1990's. However, offsets have resulted in additional business opportunities for and technology transfer to the foreign manufacturers. At the same time, foreign ownership of American companies increased and new foreign-owned plants were constructed in the United States, accelerating the diffusion of technology. Although it is difficult to fully evaluate the contribution of offsets to the present ascendancy of foreign gear firms, it could have been extremely significant. (DoC, 1997)

BXA's survey of industry received responses from seven aerospace gear companies who all reported a negative impact of offsets on their operations. Six of the companies produced open gears while one of the firms was an independent (i.e., non-captive) gearbox producer that subcontracted for all gear elements. The gearbox maker reported increased overseas competition as a direct result of offsets. Each of the six open gear producers reported significant lost business. Other contractors reported that prime contractors are increasingly purchasing both gears and gear parts from overseas producers due to offset arrangements. (DoC, 1997) As with machine tools, these offsets introduced some U.S. end-user firms to new potential foreign suppliers of aerospace gears,

relationships that will continue over time as U.S. prime contractors engage in offset agreements.

Offsets, in the forms of technology transfer and co-production, have had adverse effects on the U.S. aerospace gear market. This extremely small and specialized market is both vital for the defense industrial base and vulnerable to overseas competition. Because of the specialization and expense of aerospace gears, must manufacturers are small companies (at the sub-contractor level) and rely heavily on defense related orders for their business. Therefore, any offset agreements made by prime contractors to facilitate an overseas sale that result in aerospace gear orders or technology going to overseas firms could have extremely serious competition, market share, and employment consequences for these small firms.

G. SUMMARY

This chapter has examined the reactions of different sectors of the U.S. defense industry towards offsets. Both survey data and anecdotal evidence taken from interviews with defense industry representatives was used. The evidence seems to suggest that larger firms, however reluctantly, see the need for offsets and vigorously defend their usage. They argue that the use of offsets, although not free of adverse effects, ultimately supports U.S. defense industry employment by creating jobs where they may have been lost without utilizing offsets. Additionally, offsets, in the long run, do not adversely effect the U.S. balance of trade and are necessary in order that U.S. defense firms can stay competitive in the global arms market.

Medium to small firms, however, have predominantly negative assessments towards the effects of offsets on their business. The BXA survey indicated that smaller firms seem to be more negatively impacted by offsets than larger firms and that these small firms have seen a steady decline in the amount to defense related business they are involved in. Interviews of smaller subcontractors by the author show that this reaction towards offsets is still prevalent. The vast majority of smaller firms interviewed indicated that the use of offsets has had negative impacts on their employment, the amount of business they are doing with larger defense firms, and their ability to compete in the defense marketplace due to both larger firms sourcing subcontractor activity overseas and new foreign entrants into the market.

The chapter concluded with two example of how offsets seem to have adversely effected two important sectors of the U.S. defense industry – the machine tool industry and the aerospace gear industry. In both cases, offset transactions have led to increased foreign participation in these sectors and a subsequent decrease in U.S. dominance of that particular market. These cases show that although on a macroeconomic level the effects of offsets on the U.S. industrial base may be difficult to quantify, both at the sector and firm levels offset agreements are negatively impacting U.S. defense subcontractors.

It is clear that there is a clear divide over this issue between the large defense firms and the medium and smaller sized subcontractors. Both argue that their particular position towards offsets is based on their desire to survive in the global marketplace. Large firms see offsets as a marketing tool through which they can attract customers and continue making their products. Smaller firms see offsets as an avenue where foreign

producers receive an unfair advantage over them, costing them work and jobs. Is there, and should there, be a remedy to this issue? Should the United States regulate offsets more closely in order to preserve the health of the U.S. defense industrial base, especially at the small firm level, or would the potential negative consequences (i.e., loss of competitiveness, fewer overseas defense contracts, and the subsequent negative side effects towards employment and trade) of regulating them detract from any potential benefits? Should market forces alone be allowed to solve this problem, with the customer ultimately going to the producer who can give them the best product? These questions will be explored in Chapter V.

V. ROLE OF THE U.S. GOVERNMENT REGARDING OFFSETS

From an industry perspective, most companies would prefer to compete on the basis of quality and price of their primary product, rather than participate in offset agreements. In general, U.S. defense firms are not in the consulting, technology, risk capital, or trading business. However, because of foreign government demands, offsets have become a recognized part of doing business with customers, and U.S. defense firms are responding to these demands. As one major defense firm spokesman said, "It is our belief, and this is a belief held throughout the defense industry, that offsets are here to stay" (Boeing, 1998).

As Chapters III and IV have documented, however, there exist a wide range of data and opinions regarding both the perceived advantages and disadvantages of offsets for the defense industrial base. On one hand, larger firms maintain that offsets are necessary in order for U.S. defense companies to stay competitive and promote sales. Smaller firms, for the most part, claim that this marketing practice is slowly squeezing them out of the marketplace and if continued, will erode the U.S. defense industry at the subcontractor level.

The U.S. Government is committed to maintaining the defense industrial base. As John B. Goodman, Deputy Under Secretary of Defense for Industrial Affairs and Installations said before the Senate Armed Service Committee:

> The Quadrennial Defense Review highlighted three strategic challenges facing the Department of Defense. DOD must seek to shape the international environment, respond to the full spectrum of crises that threaten U.S. interests, and prepare now for an uncertain future. To meet

> these challenges and support the required revolution in military affairs, DOD must be able to draw on a supplier base that can design and produce next generation weapons, innovate to preserve our technological leadership, reduce cycle times to respond to evolving threats, lower costs significantly, and support interoperability for joint and coalition warfare wit hour allies. (Goodman, 1998)

One of DoD's strategies for accomplishing this is to "Maintain effective competition (both horizontal and vertical) in the defense industrial base" (Goodman, 1998).

Thus, because of the U.S. Government's stated policy goal of maintaining America's defense industrial base, it is inescapably involved in offsets. The U.S. Government becomes involved in this process by restricting certain types of technology transfer, third country transfer prohibitions, and various legislative and administrative mandates designed to oversee the effect of offset agreements on U.S. political, economic, and military interests. However, the increasing demand for offsets has raised concerns that existing policy guidance is inadequate to protect U.S. security and economic interests. Both within the industrial sector and Congress, increased restrictions are being called for in order to prevent some of the potentially adverse effects of offsets described above. Once again, the level of Government involvement is a contentious issue. James McInerney, Jr., then executive Vice-President of the American League of Exporting Security Assistance, said at a Government/industry conference that "Those things [offsets] need to be business deals among business men...Government has no business overseeing offsets" (FAS, 1994).

This chapter will explain the current U.S. Government policy regarding offsets and will then explore varying levels of Government involvement in this practice. Both

the potential advantages and disadvantages will be explained. The chapter concludes with explanations of previous attempts to regulate offsets in international defense trade.

A. CURRENT GOVERNMENT POLICY REGARDING OFFSETS

The Duncan Memorandum of 1978, described in Chapter 2, established the U.S.' policy regarding offsets until 1989. The National Defense Authorization Act of 1989 legislated a statutory requirement for the Executive Branch to publish a policy on offsets in military exports. The Bush Administration issued its policy statement on April 16, 1990 and it read in part:

> No agency of the U.S. Government shall encourage, enter directly into, or commit U.S. firms to any offset arrangements in connection with the sale of defense goods or services to foreign governments.
>
> U.S. Government funds shall not be used to finance offsets in security assistance transactions except in accordance with currently established policies and procedures.
>
> Nothing in this policy shall prevent agencies of the U.S. Government from fulfilling obligations incurred through international agreements entered into prior to the issuance of this policy.
>
> The decision whether to engage in offsets, and the responsibility for negotiating and implementing offset arrangements, resides with the companies involved.
>
> Any exception to this policy must be approved by the President through the National Security Council.
>
> The President also noted that the time has come to consult with our friends and allies regarding the use of offsets in defense procurement. He has, therefore, directed the Secretary of Defense, in coordination with the Secretary of State, to lead an interagency team to consult with foreign nations with a view to limiting the adverse effects of offsets in defense procurement. The interagency team will report periodically on the results of these consultations and forward any recommendations to the National Security Council. (Office of the Press Secretary, 1990)

The policy stated above recognizes that offsets do exist as a method of doing business, but that the U.S. Government will neither offer offsets nor enter into offset agreements in order to facilitate a foreign military sale. However, the U.S. Government will not prevent private companies from entering into these agreements, subject to U.S. Government oversight, as long as the private company assumes all responsibility for the facilitation of the agreement. The Clinton Administration has thus far endorsed the Bush policy. In 1993, then Deputy Secretary of Defense William Perry said;

> We view the decisions regarding offsets as matters best left to U.S. industry to negotiate and implement as part of their ongoing business activities. The principal objective of the current policy is to give U.S. companies the flexibility to structure arrangements that allow them to compete effectively for foreign sales. If U.S. defense manufacturers were unable to provide offsets, foreign governments would often be unable to raise domestic political support for defense purchases from the U.S., and U.S. industry would lose sales to foreign competitors willing to provide offsets. (FAS, 1994)

While the Executive Branch views offsets as an economically inefficient irritant, it also recognizes them as a marketing technique and a form of export financing. Realizing that the government making the arms purchase has objectives beyond procuring arms at a cost effective price such as political acceptability, the maintenance of domestic defense and commercial industries, and preserving foreign exchange, it follows that U.S. offset policies are influenced by foreign policy/national security concerns that may conflict with economic efficiency. These concerns include the following;

> Offset agreements help facilitate arms transfers which enhance the preparedness of allies and friends by providing them with the tools to defend themselves.

> Cooperative agreements, coproduction, and licensed production contribute to our allied preparedness by enhancing our allies' ability to contribute to the productive capacity of the entire alliance.
>
> Coproduction and licensed production offset agreements promote rationalization, standardization and interoperability with our allies by providing for the use of common weapons systems.
>
> Offsets directly contribute to foreign sales, but also reduce the cost of DoD purchases by allowing U.S. producers to allocate overhead costs across a large base, thus contributing to economies of scale. The additional business also enhances the overall health of the U.S. industrial base. (OMB, 1990)

Some may view the Executive Branch's position as a predominantly laissez-faire policy, avoiding offsets by allowing private businesses to negotiate the details of offset agreements subject to some U.S. Government oversight to ensure national security is not compromised. However, since preserving the U.S. industrial base is a priority of the Clinton Administration, what level of U.S. Government involvement is necessary to protect the U.S. industrial base, ensure national security, yet also foster competitiveness?

B. LEVELS OF GOVERNMENT INVOLVEMENT

1. Non-Involvement

Total non-involvement by the U.S. Government would mean that oversight of offset agreements would be left to private businesses. Not only would private companies be the negotiators of these agreements, they would also be responsible for regulating these agreements to ensure that U.S. national security would not be compromised. Proponents of this policy argue that a free and open defense trade market would ensure that the best, most capable weapons would be delivered at the lowest cost. Additionally, some in business believe that offset decisions should be left in the hands of those

companies involved in the agreement, "...we are in the best position to judge what is needed to win a particular competition...and what technology can be transferred without jeopardy to our future competitive position" (Hessler, 1988).

Total non-involvement, however, is simply not an option when decisions regarding the promulgation of defense related technology are involved. There are too many potential risks to national security in the areas of both arms and technology transfer. U.S. Government oversight is necessary to ensure that national security is not compromised while still allowing companies to be competitive in the global arms market. All four prime contractors interviewed for this thesis stated that although less government involvement in their business affairs was desirable it was unrealistic to expect the U.S. Government to reduce its oversight role in the sale of defense items.

U.S. Government interest in offsets is also spurred by the complaints of defense subcontractors. Small- to medium-sized subcontractors are increasingly complaining to elected officials about how offsets are hurting their respective industries (DoC, 1998). Six small- to medium-sized businesses interviewed for this thesis insisted that increased U.S. Government involvement in controlling offsets was necessary to prevent the demise of their particular defense industry (for example, machine tooling or gear production) due to increased overseas production or reductions in business work orders.

Congressional interest in offsets has increased and Congress will not allow this trade practice to be unregulated. Since 1984, eight GAO reports have dealt with the practice of offsets and their effects on the U.S. defense industry. In 1987 Representative Barbara Kennelly of Connecticut introduced a bill requiring the President to engage in

bilateral and multilateral negotiations with foreign governments to limit the use of offsets in defense sales (Woodward, 1995). Congressional legislation introduced by Representative Alan Dixon of Illinois in 1989 requires the Department of Commerce to compile and submit an annual report detailing the use of offsets in the defense trade (OMB, 1990). In 1994, Senator Russell Feingold of Wisconsin introduced legislation that requires the President, on high dollar weapons sales, to certify to Congress whether offsets will be involved in a weapons sale (Russin, 1994). The level of Congressional interest in offsets is further illustrated by the fact that five pairs of Congressional committees (Foreign Affairs, Armed Services, Banking, Commerce, and Government Operations) currently exert some sort of jurisdiction over offsets in military trade (OMB, 1990). In August of 1998, Congressmen Henry Waxman of California and John Tierney of Massachusetts conducted hearings in Boston, Massachusetts to discuss and assess how offsets affect defense subcontractors. Additionally, the offset issue will be on the Congressional agenda next session (105th Congress): Congress is considering modifying Section 309 offset reporting requirements and and lobbying for international offset consultations with the European Union.

2. Negotiations

The legal authority for the U.S. Government to negotiate limitations on military offsets with other governments derives from several sources. Under the Constitution, the power to regulate commerce with foreign nations resides with the Congress, while the President, with the advice and consent of the Senate, has the constitutional power to make treaties. The Trade Agreements Act of 1934 and successor legislation have augmented

the authority of the President to enter into and enforce trade agreements to reduce both tariff and non-tariff barriers to trade. Separate constitutional and legislative authority exists for regulating the foreign transfer of military goods and related services and technology for national security or foreign policy reasons. Generally, the U.S. Government enters into three types of trade agreements – unilateral, bilateral, and multilateral.

a. Unilateral Agreements

Unilateral agreements are where the U.S. Government legislates a national trade policy, forcing U.S. companies to adhere to it. However, this type of agreement is solely a U.S. policy – other countries neither enter into this agreement nor are bound to observe it. In the case of a unilateral policy restricting offsets, the U.S. Government would restrict U.S. companies from engaging in offset activities – companies would have to enter into arms agreements on a strictly cash basis.

The only real advantage of a unilateral restriction is that it would reduce the amount of U.S. Government effort involved in overseeing and regulating these agreements. The potential disadvantages, however, are significant to U.S. businesses. If the U.S. unilaterally restricted the use of offsets but foreign countries did not follow suit, the end result would be a shift in arms sales away from U.S. businesses to other producers where purchasers could not only purchase weapons systems but also secure advantageous offset agreements (Johnson, 1987). Most countries would shift their weapons purchases away from the U.S. to countries still offering offsets, hurting the defense industry. For example, one unilateral restriction that the U.S. Government does impose on U.S.

businesses is that they may not utilize bribery to help facilitate sales agreements, a practice common in many other countries. As a result, U.S. companies have lost some sales overseas (DoC, 1998). A unilateral restriction on offsets would reduce U.S. companies' ability to compete head-to-head for sales, resulting in fewer sales, less market share, and a loss of defense related jobs. These ill effects would eventually be felt at all levels of the defense industry as decreasing weapons sales reduced the output of prime and sub-contractors. All companies interviewed for this thesis were opposed to a unilateral offset policy claiming that this policy would reduce their ability to compete in the defense market.

Another type of unilateral policy that the U.S. Government could pursue in order to protect the U.S. defense industrial base would be to nationalize, or underwrite, the defense industry. This policy would be similar to the defense industrial policy in France. Such a policy would greatly increase the Governmental control of this industry and, potentially, provide U.S. defense contractors with a great deal of economic security. Therefore, some of the problems posed by offsets (reduced trade, employment, and competitiveness) would be alleviated since the U.S. Government would provide an economic "safety net" for defense contractors. However, this type of unilateral defense policy is extremely unlikely. First, pursuing a nationalized defense industry may lead to inferior defense products since the necessity to develop the best product in order to compete would be minimized. Second, nationalizing an industry directly contradicts the free market, capitalist philosophy that the U.S. economy is based upon. The third, and probably most important, argument against pursuing this type of policy is that huge

monetary outlays would be required to implement it. In this era of shrinking U.S. Government budgets, it is extremely unlikely that this type of expensive industrial policy would be widely supported by legislators.

b. Bilateral and Multilateral Agreements

Bilateral and multilateral trade agreements are those the United States negotiates with one country or several countries, respectively. In these cases, the signatory countries agree to honor and enforce the conditions of the treaty being negotiated. All of the companies interviewed for this thesis stated that bilateral or multilateral treaties were the best avenues by which the U.S. Government could control the use of offsets. Three large companies, however, greatly favored multilateral treaties since such a treaty, by definition, would involve more customers and partners in the global marketplace.

The primary advantage of a bilateral agreement is that they are relatively easy to negotiate since the U.S. would be dealing with only one country/economic entity. Especially if the United States could apply some leverage to that country, very advantageous agreements could be made that both facilitated a beneficial sale for the arms manufacturer and also limited the types and size of any offset (DoC, 1998). An example of a bilateral trade agreement that has both been economically fair and equitably enforced is the U.S.-EC agreement on Large Civil Aircraft that was negotiated as part of the General Agreement on Tariffs and Trade (GATT) treaty. This agreement ended the competition for giving the lowest interest rates on aircraft export sales, further enabling the sale of large aircraft to be based solely on the quality of the product and best price

(DoC, 1998). The agreement also established limits on government support (subsidies) for the development of new aircraft and increased the requirements for the disclosure of government support for these aircraft (Barber & Scott, 1995). Bilateral agreements do have drawbacks, however. A country may enter a bilateral agreement with the U.S. agreeing not to ask for offsets from U.S. producers and then turn to other suppliers who still offer offsets. This lost sale certainly would not benefit any sector of the U.S. defense industrial base. Additionally, laxly enforced bilateral agreements could simply drive offset practices underground, both disadvantaging U.S. producers and creating a new arena of illegal trade practices (Johnson, 1988).

Multilateral agreements would prevent signatory countries from avoiding U.S. suppliers and looking elsewhere for offset agreements since they could not be offered by the other major arms producers. Additionally, enforcement of these agreements may be somewhat easier since it would be to the economic advantage of all signatory countries to maintain an equitable level of competition. An example of a multilateral agreement is the 1979 GATT civil aircraft code which was agreed upon and signed by 22 countries. This agreement prohibits tariffs on civil aircraft, engines, and most aircraft components, established rules on potentially discriminatory governmental actions, and bans the use of export subsidies for manufactured goods (Barber & Scott, 1995). The primary disadvantage of multilateral agreements is that they are difficult to negotiate since countries with varying economic and military goals would be involved (for example, the 1979 GATT aircraft code has not yet been revised and incorporated into the World Trade Organization because the signatory countries can not agree on the tariff

and subsidy provisions for the new code). Many buying countries that request offsets see them as too advantageous to negotiate away in a multilateral agreement. In order to work, the U.S. would have to sign multilateral agreements with all major arms producers limiting the use of offsets.

The better type of agreement for the United States to use in order to limit the use of offsets would be a multilateral treaty. Although difficult to form, it would be more beneficial for the U.S. since purchasing countries would be less able to simply take their business to other offset-offering arms producers. Although offsets may not be completely eliminated as a trade practice, multilateral agreements could clearly define and limit offset practices in order to assure fair competition and guard against any restraint of trade. It must be emphasized, however, that these agreements need to be formed primarily with other seller nations in order to maintain fair competition. An excellent example of a multilateral agreement involving a weapons system is that between the United States, the United Kingdom, and the Netherlands for the development and procurement of the Joint Strike Fighter. These three nations have shared in the research and development costs of the aircraft and will also share costs during the production phase. Each country possesses partial ownership of the aircraft and, as of this writing, no offset requirements have been stipulated between these countries for the procurement of the aircraft (DoC, 1998).

C. THE GATT AND NATO DISCUSSIONS ON OFFSETS

Increased demands by foreign governments for offsets associated with purchases of U.S. arms and the possible negative impact of these demands on the U.S. industrial

base and trade interests have raised concerns within the U.S. Government and American defense industries. The defense industry's concerns regarding offset legislation stem from the fear that any legislation aimed at countering such practices would simply result in the customer turning to another supplier who is not encumbered by offset restrictions. While they oppose the U.S. Government adopting unilateral provisions restricting offset agreements, the defense industry does endorse steps taken in a bilateral or multilateral fashion. Their recommendations originate from their desire to compete in the marketplace and long term survival. As explained previously in this chapter, the U.S. Government views offsets as a bothersome yet useful tool in protecting the national security of the United States. This section will highlight two of the treaties the U.S. has pursued to limit the practice of offsets.

1. General Agreement on Tariffs and Trade (GATT)

The GATT is the principal international body concerned with negotiating the reduction of trade barriers and with international trading relations. The original GATT document contains several exceptions, including a broadly worded "Security Exceptions" article. Article XXI, among other things, exempts the actions taken by the contracting parties with respect to "ammunition and implements of war ... for the purpose of supplying a military establishment" from the obligations contained in the other GATT articles (OMB, 1990). This treaty "loophole" has enabled the facilitation and growth of offsets associated with the sale of military articles.

Over the last 30 years, the GATT's activities and its legal instruments have been expanded in response to shifts in the global economic structure. During the Tokyo Round

of multilateral negotiations an Agreement on Government Procurement was written for a sector which heretofore had not been subject the GATT disciplines. This code provides for national, non-discriminatory treatment by signatory governments and the specific agencies of those governments as agreed among the signatories. While some defense agencies are covered by this code, "procurement indispensable for national security or for national defense purposes" is, once again, excepted. (Eisenhour, 1989)

As part of the Uruguay Round of multilateral trade negotiations, the United States has proposed several areas currently covered by GATT rules that need strengthening as well as development and application of GATT rules to new trade areas. In an area directly related to military offsets, the Agreement on Government Procurement, there have been ongoing efforts to tighten the disciplinary provision of the agreement, expand the entity coverage, extend the participation in the agreement to new signatories, and apply the agreement to services. While governmental actions, services, and procurements related to national defense are not currently under consideration as targets of GATT modification, improved discipline in related areas of governmental activity could reduce some of the possible negative impacts of military offsets. (OMB, 1990)

2. NATO Discussions

In light of new world power realities, a concept has emerged that a new "defense trade GATT" is needed. On March 15, 1990, Ambassador William H. Taft, IV, U.S. Permanent Representative to the North Atlantic Treaty Organization (NATO) advocated this approach:

> In the world defense trade arena...no generally agreed rules of the road exist. Consequently, the defense trade market is characterized by protectionism, subsidization and suspicion. To address this we should consider the utility of establishing the equivalent of a defense GATT...
>
> Like the 97-member GATT, the NATO defense GATT would have to recognize the political requirements of international defense trade. Any such deviations from open, nondiscriminatory trading practices would, however, in this case at least be on the table and visible to all members; exceptions would be seen to be exceptions.
>
> All nations have trade restricting practices in defense – Buy American, Buy European. All countries participating in the defense GATT would have to expose these restrictions. An open, efficient international market in defense goods will clearly be worth the compromises each nation will have to make, especially knowing that all others are making the same compromises. (OMB, 1990)

For a two-year period (1992-1993) extensive meetings took place at NATO and in member capitals to establish a generic "ground rules" document to initiate a defense trade discussion at NATO among the allies. The draft "NATO Code of Conduct in Defense Trade" was to define the "Principles for Improving Defense Trade Among the Allies" including transparency of national procurements, contracting and auditing procedures, quality control, technology transfer, re-export requirements, and removal of barriers to defense trade.

The following statement was included in the draft Code of Conduct regarding offsets:

> Offsets constitute an integral part of the industrial policy of certain countries. Nevertheless, those countries will progressively reduce, towards timely elimination, their offset requirements, once they have noted real progress in the opening up of markets, in the transfer of technology, and in the participation in common research, development, and production programs. This process towards elimination will be reciprocal, and will take into account the different approaches to defense trade among the members of the Alliance. (NATO, 1993)

In late 1993 an agreement to formally approve the Code of Conduct and move into the implementation phase failed. Although offset language alone was not the reason for the failure to reach final agreement, it did remain an issue of debate until the discussions were suspended. Even the rather expansive statement of principle regarding gradual elimination of offsets was viewed by some nations as posing serious difficulties, while the U.S. saw this language as providing inadequate discipline on offsets. Further discussions of offsets within NATO were, consequently, never agreed on among the allies. (DoC, 1996)

D. SUMMARY

Presently, the United States Government's role with regards to offsets is that of oversight. It only gets involved in the offset agreements made between U.S. arms producers and foreign buyers to ensure that vital technology or weapons systems are not being transferred. Although the U.S. Government recognizes that offsets are a trade distortion and can have negative impacts on the U.S. economy, they do tolerate their use so that U.S. arms producers can maintain competitiveness in an ever-increasing competitive global arms market. However, treaties limiting the use of offsets would be beneficial for all parties: prime contractors would be able to compete their products based solely on price, capability, and delivery schedule; U.S. subcontractors would be less prone to lost market share and jobs due to increased foreign competition nurtured by offsets; and the U.S. Government's national security concerns would be satisfied since

their oversight of arms sales would continue but without having to regulate the use of varying types of offsets.

If treaties are to be used, the most advantageous instrument for the U.S. Government to utilize would be a multilateral treaty (similar to the GATT trade treaties) signed by all major global arms producers. A multilateral treaty would be more difficult to write but would be far more beneficial for the United States in the long run. It would prevent buyer countries from avoiding U.S. arms manufacturers and taking their business elsewhere so that they could obtain offset agreements. Additionally, a multilateral treaty would be easier to enforce since all the signatory nations would strive to enforce it in order to prevent an "rogue" seller nation from gaining an unfair competitive advantage.

Although preliminary talks and some negotiations have been attempted on offsets, no treaty limiting their use has been signed. While multilateral trade agreements regarding civil aircraft and other products have existed for several years, defense related multilateral agreements that include offset limiting provisions are in their infancy. While the potential benefits of these agreements are attractive, it will be difficult to resolve a number of threshold issues in order to conduct the negotiation stage with a reasonable expectation of both a timely and successful result.

One obstacle is that the GATT treaties that codify international trade relations contain clauses that exempt trade related to a country's national security. This exception provides arms sellers and purchasers broad leeway with which to design arms sales aimed at bolstering a country's national security. Understandably, the maintenance of national security and methods by which a country does so can be very sensitive. Many countries

are extremely hesitant to relinquish any tool they may have (offsets in this case) to build and sustain their national defense.

Another obstacle to an offset-limiting treaty is that in the current global arms market, it is the buyer countries that have the leverage. Both declining defense budgets and arms purchases are forcing arms producers to offer increasingly lucrative offset packages to stay competitive. Certainly, purchasing countries do not want to sacrifice these deals and will not easily agree to any treaty whose aim is to phase out this trade practice. Additionally, any multilateral treaty would have to be signed by all major arms producers within a very close time frame. If not, one or more countries still offering offsets would gain a huge advantage over those countries not offering them, possibly inflicting large damage on the economies and defense industrial bases of the treaty signers.

VI. CONCLUSIONS AND RECOMMENDATIONS

A. INTRODUCTION

The enhanced national security of the United States is the ultimate aim of the nation's foreign policy. One of the primary methods used to carry out our foreign and national security policy has been and still remains the transfer of defense articles, defense services, military training, and economic assistance or, stating it another way, by providing security assistance. Not only is security assistance used to aid other nations, it also furthers U.S. interests by enhancing deterrence, strengthening alliances, promoting regional stability, ensuring access to vital overseas facilities, improving U.S. power projection and forward defense capabilities, and reinforcing relationships in order to assure access to vital raw materials. U.S. policy-makers have increasingly utilized this practice both during the Cold War to contain communism and after the demise of the Soviet Union in order to maintain regional stability in an ever-increasing unstable world.

Just as security assistance has increased, so has the use of offsets. These compensation type agreements between arms purchasers and sellers have enjoyed growing popularity for several reasons. For the U.S. arms seller, they help win defense contracts, an increasingly difficult task in this era of reduced defense budgets and growing competition. For the weapons buyer, offsets are extremely attractive. Not only can they reduce the overall price of a weapons system, they may also assist the buying country in pursuing its own economic development agenda. The use of offsets, however,

is being increasingly monitored by U.S. Government agencies in response to the concerns of both defense contractors and Congressional representatives.

Offsets, at least for the near future, are here to stay and will be increasingly utilized by weapons sellers and buyers alike. While offsets are valuable as a marketing tool, their use does pose some problems to the U.S. defense industrial base that can not be ignored. Negative repercussions on the employment, trade, and the competitiveness of American defense businesses may arise if the use of offsets is not carefully considered, planned, and regulated.

B. CONCLUSIONS

The scope of this research effort has led to several conclusions concerning the use, growth, and future control of offset agreements.

Conclusion 1. The use of offsets to facilitate overseas weapons sales is extremely prevalent due to increased competition and customer requirements.

Simply put, the use of offsets is now commonplace and they are not going to go away. As a result of the U.S. defense procurement budget steadily decreasing since the end of the Cold War, domestic arms manufacturers have become increasingly dependent on overseas markets. Therefore, they are willing to formulate offset agreements if, by so doing, they can guarantee a sale. U.S. weapons sellers, in order to stay competitive and win contracts, are agreeing to these increasing offset requirements rather than risk losing business. Additionally, weapons buyers are imposing many types of offset requirements as a condition of sale. Not only do these offsets help reduce the total purchase price, these agreements can also help the purchasing country pursue other domestic economic

goals. As the demand for offset transactions has increased, so has the monetary value and length of these offset obligations, forcing U.S. businesses to become immersed in this trade practice.

Conclusion 2. The macroeconomic effects of offsets on the U.S. defense industry are inconclusive.

The 1990 OMB study on the effects of offsets on the U.S. defense industry contained serious errors in both its scope and data collection. OMB concluded that the net result of the transactions discussed in their report had a favorable effect on the U.S. economy. However, these results were reached by using suspect data obtained from prime contractors, referencing outdated input-output tables, and making broad generalizations on how various offsets would effect the economy. When DoC took over the annual reporting requirement for offsets, they did not conduct any analyses on how offsets were effecting the defense industry. Their rationale for not conducting this analysis was that it was too difficult to measure the long-term effects of all offset transactions (especially indirect offsets) on the entire U.S. defense industry. In essence, the scope of the offset analysis was too large and involved too many unknowns, precluding the formulation of any valid conclusions.

Conclusion 3. Weapons purchasers will continue to demand more indirect offsets then direct offsets when formulating offset agreements.

Currently, the ratio of indirect offsets to direct offsets is approximately 60/40. As more countries with less developed economies and defense infrastructures purchase weapons systems from U.S. arms manufacturers, this trend should continue. Indirect offsets are more useful to the economic and industrial goals of these lesser developed

countries since they can take a variety of different forms (investment, technology transfer, countertrade, etc.) and may offer more economic benefit and opportunities. Since direct offsets are directly related to the weapons system being purchased, their utility is limited. Many lesser developed countries are not solely intent on building their domestic defense industries. Indirect offsets may be preferred in order to strengthen non-defense sectors of the economy. Additionally, while nations possessing a more mature defense industrial base may desire some direct offsets, indirect offsets can also be quite attractive. All arms purchasers can utilize the benefits of indirect offsets while direct offsets are useful to only a fraction of this group.

Conclusion 4. Large and small defense subcontractors have widely disparaging views on the advantages and disadvantages of using offsets as a marketing tool.

Both an extensive literature review and interviews with large defense contractors revealed that, although they would prefer not to use offsets, large contractors do see them as necessary for business. Large contractors claim that without offset agreements, foreign buyers would simply take their business elsewhere. Therefore, using offsets reaps benefits by promoting overseas business, maintaining domestic defense employment, and allowing contractors to stay competitive in the global arms market.

A majority of small- to medium-sized defense contractors, however, claim that offsets are slowly eroding the U.S. defense industrial base at the subcontractor level. They argue that the large contractors who formulate the offset agreements are passing the costs of these agreements down to the lower tiered contractors. These costs come in various forms – contract work being done overseas, the establishment of overseas co-

production plants, and technology transfer. As a result of these offset transactions, smaller subcontractors are facing increased unfair competition (since large contractors are contractually obligated to have subcontractor work performed overseas) and are receiving less work orders. Consequently, some companies have to diversify out of the defense business, decrease employment and overhead, or close. Both Bureau of Export Analysis data and specific industrial sector analyses presented in this thesis tend to support the conclusion that offsets are having a negative impact for smaller defense contractors.

Conclusion 5. The role of the U.S. Government in the monitoring and regulation of offsets is ambiguous.

The U.S. Government has a vested interest in the monitoring and regulation of offsets, both from a national security point of view and the maintenance of its domestic industrial base. However, U.S. Government responsibility for these agreements was waived in 1978 with the Duncan Memorandum, and the Government's role became one of oversight. While the Government accepts that offsets may be necessary for weapons sales, they are primarily seen as an economically inefficient irritant used by the private sector as a marketing tool. Large contractors are hesitant to agree to increased Federal involvement, fearing offset restrictions that may reduce their global competitiveness. Smaller businesses, however, argue that without some sort of Government control the defense industrial base is being slowly eroded at the subcontractor level.

Currently, five pairs of Congressional committees have a hand in offsets and there is mounting Congressional concern regarding their use and their long-term effects on the domestic economy. The Department of State and Department of Defense are the

Executive agencies responsible for reviewing offset agreements. The Department of Commerce is responsible for monitoring and reporting offset transactions despite the fact that the DoC may have a conflict of interest since they are also responsible for promoting international trade for American businesses. Clearly, the oversight, regulation, and reporting of offset agreements are extremely convoluted and complex processes.

Conclusion 6. While unilateral and bilateral offset policies are possible, the most beneficial trade agreements for U.S. defense businesses are multilateral agreements.

Unilateral offset policies should be avoided since they will most likely result in weapons purchasers taking their defense business to other countries. Bilateral agreements, while relatively easy to negotiate, may still result in lost business for U.S. arms producers. Multilateral trade agreements would prevent signatory countries from avoiding U.S. suppliers and looking elsewhere for offset agreements. Additionally, enforcement of these agreements would be easier since it would be economically advantageous to all signatory countries to maintain an equitable level of competition. While multilateral agreements may not eliminate offsets, they could clearly define and limit offset practices in order to assure fair competition and prevent any restraint of trade.

C. RECOMMENDATIONS

Based on the conclusions of this research, the following recommendations are made:

Recommendation 1. Conduct a study to assess the effects of offsets on the defense industrial base by either measuring the impacts of direct offsets or by targeting specific industrial sectors.

Attempting to measure and analyze the effects of all offsets on the entire economy is an extremely daunting problem. It would require prohibitive man-hour and monetary resources to conduct an accurate and comprehensive study. As opposed to attempting to assess the impacts of offsets on the entire defense industrial base, a study that is much narrower in scope should be conducted. One method would be to measure the impacts of direct offsets on the economy. Since direct offsets are associated only with the specific weapons system being sold, the long-term economic effects would be easier to accurately track and analyze. Indirect offsets, because they may impact any sector of the economy, can be extremely difficult to monitor. An alternative method would be to conduct offset studies targeting specific industrial sectors of the defense industry (for example, fabricated metal products or valves). While these studies would not encompass the entire offset situation, the data collected and analysis completed would, hopefully, be accurate and enable some realistic generalizations to be made.

Recommendation 2. The U.S. Government should encourage both U.S. contractors and weapons purchasers to use more direct offsets.

Indirect offsets pose several problems for the U.S. defense industrial base. First, by definition they involve goods or exports that are not related to the weapons system being purchased. Therefore, they can be extremely difficult to track. Additionally, indirect offsets may have far-reaching adverse effects on several different sectors of the U.S. economy, not only those associated with the defense industry. It is in the U.S.' national security interest to encourage its allies to purchase American weapons systems and to assist them in arming themselves. Direct offsets aid in this process. Indirect

offsets, however, are used by some countries as a part of their economic development strategy. The United States should not be fostering this growth at the risk of harming its own economy.

Recommendation 3. The U.S. Government must take a more active role protecting crucial sectors of the defense industrial base.

It is the policy of the United States to protect its defense industrial base. While this does not mean that the Government should curtail free trade or fair competition, it is in the Government's best interest to protect highly specialized and essential sectors of the defense industry (for example, machine tools). Offsets have had adverse impacts on some of these sectors. Since many of these industries consist of very small contractors and family owned businesses, the results of offset agreements that send work overseas can be devastating, driving some of these essential businesses out of the market and reducing the aggregate U.S. defense industrial base. The U.S. Government should determine those sectors of the economy that are extremely vital for the defense industry and implement measures that will help protect them from adverse offset agreements.

Recommendation 4. The U.S. Government should review and streamline its offset tracking and monitoring process.

The U.S. Government should review and modify, as necessary, current U.S. Government policy on offsets in defense trade and respond to the changing nature of offset demands, reflecting both the need for U.S. firms to remain competitive in international arms markets and the need to maintain the U.S.' defense industrial base.

There are presently nine Federal agencies or Congressional bodies involved in offset regulation, monitoring, and approval. In order to gain greater control over offsets,

some degree of process re-engineering is required that would reduce both the number of agencies involved and the procedural and regulatory processes associated with offset agreements and implementation.

Recommendation 5. The U.S. Government should continue consultations with its trading partners in order to form multilateral agreements which limit the adverse effects of offsets in defense trade.

The United States has already implemented consultations with its trading partners on offsets in the defense trade and related military procurement issues. These consultations should continue, with the intent of initiating multilateral agreements that will limit the use of offsets in the defense trade. If necessary, negotiations could begin at the bilateral level, eventually proceeding to multilateral levels in a larger forum, such as NATO. The United States should be cautious, however, and not make any decisions to unilaterally limit offsets.

Recommendation 6. The U.S. Government should continue consultations with the defense industrial base on offsets.

The U.S. Government should consult with major U.S. arms producers, including both primes and subcontractors and suppliers, and with labor to seek their positions on minimizing the adverse effects of offsets in the defense trade.

D. FUTURE RESEARCH AREAS

This thesis evaluated the effects of offsets on the defense industrial base. As such, this study covered only a portion of the issues surrounding this complex topic. The following areas are recommended for further research:

- Evaluate the effects of offsets on a specific industrial sector of the defense industrial base (for example, the effects of offsets on the aerospace gear sector of the economy). Attempt to determine whether the impacts of offsets on a

particular defense sector can be accurately measured and what generalizations can be drawn relating these results to the entire defense industrial base.

- Assess the feasibility of the U.S. entering into either a bilateral or multilateral treaty restricting the use of offsets. Determine what the conditions of such a treaty would be and how it could be equitably enforced. A useful model may be the current GATT treaties on civil aircraft trade or the current Joint Strike Fighter production venture which includes the United States, the United Kingdom, and the Netherlands.

- Evaluate the ramifications of U.S. defense contractors offering only direct offsets when negotiating a weapons sale. Would this be a realistic strategy or would it result in arms buyers taking their business elsewhere?

- Currently, the U.S. does not require offsets when purchasing weapons systems from other countries. Conduct a study examining the advantages and disadvantages of a U.S. policy whereby it would require offsets when purchasing weapons systems.

- Research possible methods of streamlining and/or re-engineering the current offset approval and oversight systems. This analysis could include both a modification in the offset approval process or possible changes to the involvement of different Federal organizations in this process.

APPENDIX A. SUMMARY OF INDUSTRY INTERVIEWS

During July and August of 1998, the author conducted telephonic interviews with spokesmen representing different sectors of the defense industry (interviewees requested that their names be withheld). The purpose of these interviews was to gain their opinions and insights into how offsets were effecting both their particular business and the overall U.S. defense industrial base. For purposes of this thesis, small– to medium-sized businesses are defined as those with 500 or fewer employees. The interview questions were modeled after those questions asked by the Bureau of Export Analysis' Competitive Enhancement and Diversification Needs Survey. The following questions were asked in the interviews:

- Has your firm been involved in an offset agreement?
- Has your firm been negatively affected by offset agreement practices?
- Has your firm been positively affected by offset agreements?
- Is any type of legislation/regulation needed to control the use of offsets? How would your firm be affected by this control?
- If no changes are made in how the defense industry utilizes offsets, what could be the long-term consequences for you company?

The large companies represented were Boeing Corporation (237,000 employees, aircraft and aircraft parts sector), Bell-Textron (65,000 employees, aircraft and aircraft parts sector), United Defense Limited Partnership (40,000 employees, ground combat

vehicle sector), and Hughes Missile Systems (35,000 employees, missile and space vehicles sector).

The small– to medium-sized businesses represented were Aero-Gear Incorporated (150 employees, aerospace gear sector), Aero-Tech Support Systems, Incorporated (370 employees, turbine engine parts/airframe components sectors), B&E Tool Company (75 employees, fabricated metal products sector), Dynamic Controls Corporation (120 employees, aerospace engine components sector), Luminescent Systems Incorporated (130 employees, electrical lighting sector), and Quantic Industries (250 employees, ordnance and accessories sector).

Question 1. Has your firm been involved in an offset agreement?

Large Firms. All four of the large firms interviewed responded that they were heavily involved in offset agreements. The firms indicated that offsets have become a routine practice in the international arms market and that most foreign customers will not consider a U.S. firm's bid unless an offer package is included. Some countries make the offset package their top selection priority. These four firms indicated that they were not enthusiastic about offsets but believed they were a necessary evil in order to stay competitive with other U.S. and international defense firms.

Small- to Medium-Size Firms. Three of the small- to medium-sized firms indicated that they had been involved with their primes in designing portions of offset packages that dealt with their particular product. Although these firms were not enthusiastic participants in this process, they admitted that they would rather be involved and have some degree of say over what they would and would not contribute to the offset

effort. Three other firms indicated that they had not been involved in forming these agreements either directly or indirectly. The seventh firm indicated that it refused to participate with higher tiered contractors in formulating offset agreements. This firm would not participate because it believed offsets were a huge threat to their industry.

Question 2. Has your firm been negatively affected by offset agreements?

Large Firms. All four of the interviewed large contractors cited one or more of the following negative effects: short term adverse effects on U.S. employment, certain offset packages create obligations (of varying periods of time) that must be satisfied, some offset terms and conditions carry financial and political liabilities, and the design and fulfillment of offset obligations requires firms to commit significant overhead resources (financial and manpower) to these programs. All of the firms, however, claimed that these negative effects were necessary in order to make a sale.

Small- to Medium-Size Firms. All of the small and medium sized firms indicated that they had experienced varying degrees of negative effects from offsets. These negative effects included loss of contracts to prime contractors, the introduction of new overseas competitors into their particular industrial sector, loss of U.S. market share in particular sectors, and the necessity to reduce workers and facilities in order to trim their own costs. Six of the seven firms indicated that they had reduced employment during the last five years due to reduced business (they could not confirm that this loss of business was solely sue to offsets). One firm stated that they were in competition with a larger U.S. firm for an overseas sale and, although the smaller firm believed they had a better

product, the other firm was able to offer a more lucrative offset package and they won the bid.

Question 3. Has your firm been positively affected by offset agreements?

Large Firms. All four large contractors stated that offset packages promote sales which keep their employees at work, promotes trade, and aids in expanding their overseas markets. Offset agreements make them more competitive. They also stated that this positive effect – getting awarded a contract – outweighed the negative effects. Also, some offset agreements have enabled them to find overseas contractors and suppliers that are less expensive than their U.S. counterparts.

Small- to Medium-Size Firms. Of the seven small- to medium-sized firms, only two of them reported that they had experienced any positive effects. In one case, the small firm's participation in an offset agreement allowed them to find a new market for their products overseas. In the other case, the small company stated that without a particular offset agreement, the contract of the prime which they are a subcontractor for probably would not have materialized. Thus, the offset package provided by the prime contractor helped the U.S. subcontractor obtain more work.

Question 4. Is any type of legislation/regulation needed to control the use of offsets? How would your firm be affected by this control?

Large Firms. The four large firms interviewed were very uncomfortable with the idea of further Government control although none of them believed that the amount of Government oversight would decrease in the foreseeable future. The firms indicated that they are already subject to audits by the GAO and are participating in Government

sponsored reporting and monitoring programs. Two of these firms indicated a great deal of frustration with all the different Government agencies and reporting requirements already associated with offsets. All of the large firms were concerned that further Government regulation would limit their ability to offer competitive offset packages and, thus, reduce their competitive stance in the global marketplace. All of these firms were adamantly against unilateral restrictions. This type of policy would disable them from competing against foreign competitors. All of them indicated they would support initiatives to limit the amount and use of offsets but only if other global suppliers also participated in these restrictions. Three of these contractors indicated that multilateral agreements would be far more effective than bilateral agreements.

Small- to Medium-Size Firms. Six small-to medium-sized firms responded that they would welcome further Government involvement to help reduce offsets. Three of these contractors suggested that the Government should take a more active role in protecting key sectors within the defense industrial base. They indicated that this Government protection – either through aggressive export controls or some sort of Government subsidy – would ensure that vital industry and trade skills and knowledge would not leave U.S. shores. Like the large firms, these smaller companies were against unilateral restrictions. They recognized that this type of policy would hurt all sectors of the defense industry.

Question 5. If no changes are made in how the defense industry utilizes offsets, what could be the long term consequences for your company?

Large Firms. The large firms stated that they would continue to have to formulate competitive offset agreements in order to maintain overseas business. One company predicted that they may have to decrease the defense portion of their business if required offset packages continued to increase monetarily. This spokesman stated that the company would pursue more dual-use technology markets where the company would not have to become so burdened with offset agreements in order to make a sale. Another company spokesman predicted that it was possible that their company would be more willing to enter into joint agreements with allied nations to develop and produce weapons systems. Under such joint agreements, all the participating countries would be partial owners of the final product. A much different buyer-seller relationship would materialize; one where offsets would not enter into the picture.

Small- to Medium-Size Firms. All seven small- to medium-sized firms indicated that the continued use of offsets could squeeze them out of their particular market niche. If offsets continued to send work overseas and create new overseas competitors who could underbid U.S. companies, these smaller companies would either have to switch their line of business or go out of business. Three of these companies stated that the defense share of their business revenues has steadily decreased over the last five years and that they are now looking to adapt their products to less defense related uses.

APPENDIX B. INPUT-OUTPUT TABLES

The Input-Output (I-O) technique was developed by Wassily Leontief in the early 1930's. The I-O model describes a regional economy in terms of its sectors and attempts to provide a snapshot of the economy's structure by highlighting the interdependence between these sectors. It is based on the simple notion that the production of output requires inputs. These inputs can be semi-manufactured goods, raw materials, or inputs of services supplied by either households or the government. Having acquired inputs from other sectors, households, and/or government, a sector produces output and sells it either to the other producing sectors, to the final users (such as households or government), to residents of other regions, or to other firms for investment purposes (Walter, 1998). I-O takes into account the interdependence of the production plans and activities of the many industries which constitute an economy. This interdependence arises out of the fact that each industry employs the output of other industries as its raw materials. Its output, in turn, is often used by other producers as a productive factor, sometimes by those very industries from which it obtained its ingredients. For example, steel is used to make railroad cars and railroad cars are, in turn, used to transport steel and the coal and the pig iron which are used in its manufacture (Baumol, 1977).

There are two important classes of variables in I-O analysis. The first is the number of sectors in a regional economy. The number of sectors depends on the purpose for which a particular I-O table is prepared. These sectors are usually defined using the standard industrial classification (SIC) codes. Each sector is presented both as a seller

and buyer of regional and foreign output. The second variable is the sales and purchase record of each sector for a given time period (usually a calendar year). For sales and purchase records transactions tables are used. To draw a complete I-O table for a region, researchers also need data on the following variables: 1) production or output of each sector in the region; 2) sales and value added of every industry and firm within each sector; 3) labor, raw material (local and foreign), and capital costs; 4) households consumption demand; and 5) government spending and tax collection. (Walter, 1998)

Essentially, I-O tables are derived from solving a set of *N* simultaneous linear equations in *N* variables (the variables described above). When deriving the equations to construct I-O tables for different sectors of the economy, the size and complexity of these computations are dependent on both the number of sectors and transactions (Sydsaeter, 1995). The I-O calculations associated with determining the effects of both direct and indirect offsets on the defense industrial base involve thousands of variables and present an enormous statistical problem for the researcher.

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